THE LANCET.

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DEATH CERTIFICATION UNDER THE NEW ACT.

WHEN the Births and Deaths Registration Act of 1926 comes into operation on July 1st it will serve two important purposes. The first of these is the protection of the community from crime. The Act of 1874 left certain loopholes which required to be stopped up. The registrar's certificate or the coroner's order was sufficient authority for burial, but it did not always follow that either of these documents was actually produced; it remained perfectly legal for a burial to be conducted without written authority provided that the registrar was notified after the ceremony. The new Act prohibits disposal of the body except upon the registrar's certificate or coroner's order, and it sets up a system of counterchecking which should make it impossible for a document authorising the burial of one person to be used for the burial of another or for the burial of an unnotified person to be carried out without the registrar's knowledge. Further, by requiring the registration of stillbirths and by insisting that for this purpose information shall be furnished under certain specified heads, the new Act should prevent the burial of children as stillborn when in fact they were born alive, but their lives were taken shortly after birth. Another new provision is that which requires the medical practitioner to send the death certificate direct to the registrar instead of handing it to a relative, the latter practice being believed to have enabled unscrupulous persons to use certificates for improper purposes. Finally, the 1926 Act empowers the Minister of Health (with the concurrence of the Home Office) to make regulations for the following matters. The Minister may prescribe the period and form of notice to be given to the coroner before a body is removed out of England; he may impose conditions and restrictions upon embalming and upon the disposal of bodies otherwise than by burial or cremation—for example, burial at sea; he may also regulate the period of time a body may be retained after death in an inhabited house or other premises. The regulations made under this power have not yet been published.

Meanwhile the Registrar-General has been bringing his own regulations up to date by making a consolidated set governing the registration of births, stillbirths, deaths and marriages, the re-registration of the birth of legitimated persons, and the appropriate entry in the case of adopted children. The Registrar-General's regulations do not much concern the medical practitioner; the latter will, however, bear in mind his new duty (already mentioned) of delivering direct to the registrar every certificate of the cause of death. Registrars will furnish practitioners with a stock of officially franked envelopes for the posting of the certificates, and also with a stock of medical certificate books. Each form in these books is a threefold document. At the outer side there is the detachable form of notice on which the practitioner, after signing a certificate of the cause of death, must give written intimation of the fact of signing to the relative or other person liable to act as informant of the death for registration purposes. Adjoining this form of notice comes the form of medical certificate itself. The rest of the page consists of a counterfoil for the use of the medical practitioner which he is advised to fill up in all cases. The counterfoil, the medical certificate, and the notice of signing will all bear the same serial number in the case of each particular death, and will thus provide an easy method of connected reference.

The second purpose of the new Act is the compilation of more accurate medical statistics. During the half century or so since the Births and Deaths Registration Act of 1874 came into force, the form of the medical certificate of the cause of death has remained almost unaltered. The modification in the "Y" series of books, issued in the autumn of 1924, cleared up certain ambiguities which in practice were found to attach to the old form, but retained its essential characters. The contents of the certificate have now undergone radical revision after consultation with persons representing the leading bodies in the medical profession. Emphasis is again laid on the desirability of employing as far as possible only such terms to describe the cause of death as are recognised in the nomenclature of the Royal College of Physicians of London; there should be no hesitation in complying with this very reasonable wish expressed by the Registrar-General. But the difficulty of exact statement has arisen and will still arise where the practitioner in attendance during the last illness is unable to ascribe the death to a single cause; the distinction to be drawn between "primary," "secondary," and "contributory" on the existing certificate has always been found difficult to interpret, and the new form has been designed to avoid this difficulty and to make the official records of the causes of death a more exact summary of the opinions expressed in the certificate than hitherto. To this end the new form of certificate is divided into two sections. In the first section is to be entered the immediate cause of death as well as any morbid condition or conditions which led up to it, the latter being stated in order backwards from the immediate to the remoter causes. In the second section are to be entered conditions not in the immediate chain of pathological events which have led to death but which have none the less contributed seriously to the fatal issue. Examples appended to the medical certificate book serve to make these points clear; they are reproduced along with a facsimile of the new certificate itself on p. 1314 of our present number. Although provision is thus made for a series of entries, the Registrar-General begs the practitioner in each case to consider whether the essential features cannot be epitomised by statement of a single cause. The practitioner's attention is also called to the form of certification desirable in the case of deaths from cancer, childbirth, violence, or anæsthetics, and an entry on the back of the certificate form indicates to the Registrar-General whenever the practitioner is in a position to give him additional information later as to the cause of death, for the purpose of more precise statistical classification. There is no doubt that in its new form the death certificate is likely to serve its many and varied purposes better than any which has previously been devised.

THE PSYCHOLOGY OF CANCER CONTROL.

THE rather meagre reports hitherto received[1] in this country of the international cancer symposium, held at Lake Mohonk in September last under the auspices of the American Society for the Control of Cancer, are now amplified by the full proceedings. These are published as an extra number of *Surgery, Gynecology, and Obstetrics*,[2] the cost being borne by the Harry M. Lasker Memorial Fund. It will be remembered that the conference was called for the purpose of considering the prevention and cure of cancer from a practical standpoint, and of expressing in concise language the fundamental groundwork of fact and opinion upon which the collective effort now being made in the United States and other countries for the control of cancer should be continued and extended. Over 100 persons were present, and the large majority of these were not delegates but individuals invited because of their personal distinction in some aspect of cancer control. Among the 16 European guests were four from Great Britain, being Mr. SAMPSON HANDLEY, Dr. A. LEITCH, Dr. J. A. MURRAY, F.R.S., and Sir JOHN BLAND-SUTTON, the last-named being privileged to respond to the friendly greeting extended by Prof. W. H. WELCH to the foreign guests and to give the opening address in the executive sessions.

As a preliminary to further discussion, the efforts now being made in each country represented were described. These accounts, given in turn by Mr. SAMPSON HANDLEY (England), Prof. H. HARTMANN, Prof. L. BÉRARD, and Prof. T. MARIE (France), Prof. C. DU BOIS and Dr. A. REVERDIN (Switzerland), Prof. J. MAISIN (Belgium), Prof. J. FIBIGER (Denmark), Prof. R. BASTIANELLI (Italy), Prof. F. BLUMENTHAL and Dr. R. BIERICH (Germany), and Mr. G. A. SOPER, Dr. J. C. BLOODGOOD, Dr. H. C. SALTZSTEIN (U.S.A.) make interesting reading, for they show not so much a different level of knowledge or endeavour as an appreciation, conscious or unconscious, of the psychology of various peoples and of the means whereby the desired end can be achieved without arousing phobias or public antagonism in any country. Prof. H. T. DEELMAN (Holland) brought this point out clearly in discussion. He said that one part of Holland was populated largely by people of precise habits, with a predisposition for exact scientific data, who readily availed themselves of any medical assistance offered to them. It would be undesirable to plaster their walls with warnings to consult a doctor as soon as possible after the manifestation of any given symptom, since they would soon discover that not all the cases coming as soon as possible were cured, would resent being given false hope and would develop distrust of medical science. On the other hand, the inhabitants of the southern part of Holland were more careless and superficial in their mode of life, and were inclined to place faith in quacks and marvellous cures. These people felt friendly to the scientific physician but had no great respect for him. Here a warning to consult him as soon as possible might produce good results, because the cure of any case of cancer would make a deep impression. The psychological differences between nations were also emphasised by Mr. SAMPSON HANDLEY at an earlier session. He explained that the principal efforts made in Great Britain had been in the direction of fostering laboratory research, and that the sporadic attempts made at popular education had been on the whole ill-supported, because of a general national scepticism as to their value and advisability. He held that the training of the cancer specialist, the provision of facilities for consultation with him, and the education of the practitioner were likely to be the most hopeful directions of progress in this country; to the medical profession should be entrusted the duty of instructing the mass of the profession, mainly by private influence and word of mouth, in the few essential facts about cancer which are necessary for their safety. The reason why publicity methods which excite attention in other more emotional peoples make little impression in this country is that our people react well to an immediate danger but not to a contingent one. The English, according to Mr. HANDLEY, are not inclined to worry about the risks of life, regarding it at best as a dangerous business; when assured that one person in seven of 30 years of age or over will die of cancer they are unperturbed, reflecting that after all favourable odds of six to one are good enough in this uncertain world! Nevertheless, Mr. HANDLEY admitted that though the British conception of cancer control was on sound evolutionary lines, it was incomplete, and that while sensation and panic-mongering must be avoided, direct popular education on cancer by lectures and leaflets must be undertaken in order to ensure that sufferers seek early advice.

To this end we may do well to search the communications read at the conference to see whether any new facts were agreed on or any fresh ideas elicited. From the point of view of publicity the interesting discussions on how we should regard the new theories of the origin of cancer, opened by Prof. G. ROUSSY, on the value of statistical returns, and on the mortality from cancer of various civilised and uncivilised races, are of little concern, though no serious student of cancer can ignore these pronouncements. The address by Dr. W. S. SALZSTEIN on newspaper publicity in cancer control gives some useful hints, though again these are not all applicable in countries other than his own. He quotes an analysis of the relative space given by the papers during a "cancer week" to advance notices, to the reports of meetings held by a distinguished expert, and to the scientific data accumulated during the week in the free hospital diagnostic clinics, these last being of little "news value." Dr. SALZSTEIN gives as reliable sources of information for propaganda purposes the two handbooks issued by the American Society for the Control of Cancer and Mr. C. P. CHILDE'S handbook on Cancer and the Public, and notes that the article read at a previous session of the symposium by Prof. J. EWING on the Prevention of Cancer forms an admirable basis. This address evidently impressed the conference, and, indeed, supplies a temperate and thoughtful review of the subject. Prof. EWING deplores the current neglect of the prevention of cancer and points out that a rational basis for attempts at prevention lies in the fact that the major forms of the disease are due to some form of chronic irritation. All types of chronic infection and irritation should be scrutinised for their possible relation to cancer; he mentions the removal of pigmented moles and the drainage of infected antrums among the precautions less generally recognised by the profession. We would add to this list the treatment of endocervicitis manifested in the chronic vaginal discharge which is so frequent a symptom and so rarely the object of careful local investigation in general practice. Prof. EWING does point out the danger of neglected cervical lacerations and of an interrupted healing process after these lesions and cervical erosions

[1] See THE LANCET, 1926, ii., 825.

[2] Vol. xliv., May, 1927, No. 5A. Publishers for Great Britain, Baillière, Tindall and Cox.

But perhaps he hardly lays sufficient emphasis on the distaste for vaginal examination, shared by patient and doctor, which has a doubly injurious effect. Not only has the practitioner who relies on the patient's report only the vaguest idea of the general condition of her genital canal, but the fact that in this country at least a vaginal examination is so seldom part of a routine overhaul makes it more difficult for a doctor to insist on it without unduly alarming a patient if slight irregularities of menstrual bleeding should occur. In the discussion on Prof. EWING'S paper, Dr. H. R. CHARLTON said that he had noted the number of women out-patients suffering from cervicitis who had derived no benefit from such treatment as had previously been suggested to them, and he proposed the formation of a cervical cancer committee to devise a proper therapy for the inflamed cervix, to be followed by a vigorous campaign among women in favour of "pelvic prophylaxis." This suggestion deserves serious consideration. Prof. EWING also drew the attention of dentists to the intra-oral group of cancers, and urged the need of a higher standard of buccal cleanliness. Since in spite of many formidable efforts no discovery of an effective bactericidal agent had ever been made, he advocated the regular use of soap gargles and mouth-washes. Circumcision, attention to the cleansing of the skin in those who have oily skins and heavy growths of coarse hair, the avoidance of habitual abuse of the stomach and of stagnant secretions in the breast are among the ways in which he suggests the incidence of cancer may be lessened. He is hopeful that future research will add considerably to this list, and that when other means of prevention become widely known cancer may become the eliminator of the unwary, the unintelligent, and the unfit.

It is in this direction that an optimistic outlook should be directed, for Prof. EWING'S concluding remarks, quoted with approval in the course of the discussion by Prof. DEELMAN, are less cheerful in tone. These two authorities agree first that it appears more and more evident that early diagnosis alone is not capable of accomplishing the desired reduction in the death-rate, and secondly that the list of cancers incurable from their first beginnings is a long one. Prof. EWING points out that the experience of patients accomplishing a cure of early cancer is usually a severe one, while the fate of the failures is passed over in silence. The public knows these facts, and therefore any plan of squarely meeting the problem of cancer control must eventually lean heavily upon cancer prevention. Prof. CLAUDE REGAUD, who was one of the many guests to join in a warm appreciation of Prof. EWING'S survey, interpreted this conclusion in the sense that it is to laboratory researches rather than to statistics and clinical observations that we must look for further progress. Pathological histology, he holds, lies at the bottom of all classifications that we make, plays a preponderant rôle in diagnosis, and has, moreover, become the indispensable guide of all those, like himself, who devote themselves to the problem of the biological action of radiations. It is gratifying to hear these views expressed by authorities whose work is done in countries where the proportion of energy and money spent on propaganda rather than research is much greater than in our own. The attitude in this matter taken up by those who direct our imperial funds and campaigns is not only well adapted to our national psychology, but is supported by workers who have the best opportunities of critically estimating the directions in which progress is to be expected.

PRACTICE ABROAD.

THE General Medical Council has just issued a revised edition of the useful booklet,[1] compiled by its Registrar, Mr. NORMAN C. KING, which informs practitioners both at home and abroad what are the conditions under which they may practise in countries other than those in which they obtained their qualifications. Since 1921, when the report was last issued, the Treaty of Versailles has altered substantially the map of Europe, and with it many of the local ordinances of medical and dental practice. The formalities with which a foreign medical diplomate must comply in the various countries of the world vary from none at all up to the most onerous and exclusive rules. In the first category the Registrar has drawn up a table of countries or states in which persons may practise without a legal qualification of any sort. A close study of this table is very entertaining. Mr. KING remarks on the limited number of these countries, but the list includes Great Britain and its associated Dominions, Germany with Danzig, the Scandinavian peninsula, some of the central United States of North America, and a motley of lands at a low level of civilisation such as Abyssinia, Albania, Arabia, China, and Siam. There is no Latin country in this list, and one cannot help feeling that in many of the countries inhabitants may be well able to repel the foreign medical invader without statutory assistance. The appearance of Germany in the list will surprise some people; in that country not only is there no embargo on unqualified persons, but medical practice is as free as the author of "Rab and his Friends" could have wished it. This freedom is not new; both before and since the war foreigners with or without foreign qualification have been at liberty to practise in the Reich, provided that they do not describe themselves as physicians, surgeons, oculists, accoucheurs, and the like. An Englishman may, for example, style himself "physician legally admitted in England." There are, Mr. KING states, only a few exceptions from this rule. Although Great Britain is on the free list for medicine it has of course recently been removed from it for dentistry, and, we may add, for midwifery. The very large majority, however, of the 207 countries or states named in the report prohibit unqualified persons from practice, with here and there some curious exceptions. In British Guiana they are tolerated in any district which does not possess a registered practitioner. In Ontario and in certain of the North American States osteopaths chiropractors and the like are allowed to practise within certain limits; in Connecticut members of these cults are not permitted to administer drugs or perform surgical operations. The Mexican Congress is on the brink of making some decision on the subject. In Colombia an unqualified person can in certain circumstances obtain permission to practise medicine but not surgery. In Ceylon native practitioners, called vedaralas, are allowed to practise for gain, but practitioners of Western medicine are not allowed to do so unless they are registered, although an osteopath is left unmolested in his claim to treat diseases such as malaria if he does not write prescriptions for internal use.

[1] Report as to the Conditions under which Medical and Dental Practitioners, registered or legally qualified in their own country, may practise abroad. Sixth edition. Constable and Co., 10, Orange-street, London, W.C. 1927. 2*s.* 6*d.* (Post free U.K., 2*s.* 9*d.*; Colonies, 3*s.*; Abroad, 3*s.* 3*d.*).

The next category is where the right to practise is freely granted after formal proof that the applicant's name duly appears in the Medical Register; in some cases evidence of identity and of good moral character must be added. The immense region embraced by the British Commonwealth is for the most part open to the happy possessor of an U.K. registration certificate; this makes him free of India, Australia, New Zealand, South Africa, and the eastern slopes of Canada, excluding Saskatchewan and British Columbia, which have for long required a local examination; two months ago the Province of Quebec renounced reciprocity which remains for the moment one-sided. Of foreign lands, Italy and Japan alone enjoy complete reciprocity; the arrangement made with Belgium in 1915 during the period of hostilities was not confirmed at their cessation. In all other countries the existing regulations require the holder of a medical degree to pass examinations of various extent and difficulty. In France an Arts degree is very properly a necessary preliminary to the medical degree, and foreigners receive but little exemption; in Switzerland all the examinations for the federal diploma must now be taken from matriculation onwards. What penalties are exacted for defiance is not stated by the Registrar; they probably vary much in the different countries, but at one time the Swiss Federal Authority imposed a fine of 1000 francs for the first offence and for the second the same fine with extradition to the nearest frontier. A final obstacle placed in the way of medical practice by foreigners is the requirement of naturalisation. This is the case in Austria, Poland, the Balkan countries, and a number of the North American States, and Switzerland shows signs of joining the group.

The report is a compendium of accurate and interesting information, which has accumulated gradually at the Office of the General Medical Council as a result of persistent inquiry and investigation. Even those who have no present intention of leaving the country in which their qualification is obtained might well study it in order to realise the many advantages and the occasional disabilities of their position. In the case of every country or state the name of the official is given to whom request for further information should be addressed,

INTERNATIONAL CONGRESS OF OTO-RHINO-LARYNGOLOGY.

IN the days before the war there used to be held at intervals an International Congress of Laryngology. The last pre-war meeting was held in Berlin. Since the war this congress has not been revived, although there was a very successful Congress of Otology in Paris, under the presidency of Prof. Sebileau, in 1922. We are now glad to hear that the supporters of both these congresses have combined in launching an International Congress of Oto-Rhino-Laryngology. It will be the first of its kind and should be successful for many reasons. It will be held on the neutral soil of Denmark; Prof. Schmiegelow, the doyen of the specialty in Scandinavia, is the President, and he will be supported by a strong committee who are all well-known workers and very welcome visitors to this country. Finally, Copenhagen at the end of July in 1928—the date fixed for the congress—will be looking its best and should form a delightful meeting-ground.

Annotations.

"Ne quid nimis."

THE THERAPEUTIC SUBSTANCES REGULATIONS.

ALTHOUGH the Therapeutic Substances Act received the Royal Assent on August 7th, 1925, Parliament provided that the statute should not operate until a date (between one and two years later) to be fixed by Order in Council. The date thus fixed was the latest possible—namely, August 6th, 1927. Meanwhile regulations have been made by the Joint Committee under the Act, which consists of the Minister of Health as Chairman, the Secretary of State for Scotland, and the Minister of Home Affairs for Northern Ireland. These regulations will not take effect till the Act operates on August 6th; indeed that part of them which deals with labelling is not to take effect till six months later still. The regulations, dated May 31st, differ in only a few particulars (to be mentioned later) from the draft proposed by the Joint Committee which was published on April 5th. The effect of the new law is that the therapeutic substances to which the Act applies are not to be manufactured for sale without a licence. Application for such licences must be made to the "licensing authority"—in England and Wales the Minister of Health, in Scotland the Scottish Board of Health, and in Northern Ireland the Minister of Home Affairs. Applicants have to satisfy the licensing authority that they will observe various conditions in respect of adequate staff, premises, and plant, proper testing facilities, the keeping of permanent records, inspection, reports, samples, &c. A therapeutic substance advertised or sold as a proprietary medicine or contained in a medicine so advertised or sold, must be labelled with its "proper name," and must not be sold or offered for sale unless sealed in a previously sterilised glass container in such a manner as to preclude the access of bacteria. The label of the container, in addition to showing the proper name of the substance—i.e., its accepted scientific name or some name descriptive of its true nature and origin—must also give the name and address of the manufacturer, the number of his licence, a distinctive batch number, the date on which the manufacture of the batch was completed, and the nature and percentage of any added antiseptic. The label must further contain, where required, statements of minimum potency and maximum toxicity; in such cases the label must specify the date up to which the substance may be expected to retain the required potency or not to develop an excessive toxicity as the case may be; and there must be a statement of the precautions necessary for preserving the properties of the contents until that date. Sale after that date is prohibited. Schedules to the regulations prescribe the standards of strength, quality, and purity in respect of the various substances. Provision is made for testing strength, quality, sterility, and freedom from abnormal toxicity, for dealing with samples, and for preparing and using media. A special clause allows a licensee to issue a therapeutic substance to registered medical practitioners in emergency though he has no filled containers in stock; but here there are careful safeguards. Part VI. of the regulations deals with licences to import substances for purposes other than scientific research; Part VII. deals with research licences. The latter will contain conditions as to inspection and records and as to restriction of the particular research to specified premises, which recall the conditions under which experiments on animals are permitted. Part VIII. requires that containers must be labelled "to be used solely for veterinary purposes" where the substance is intended for those purposes only. The Second Schedule has minute provisions as to the production of bacterial vaccines and vaccine lymph, the use of reagents in the Schick

test, the testing of diphtheria prophylactic, and the labelling of what is a human dose; it deals also with tuberculins and tubercle vaccines, the production of all sera from living animals, and the particular provisions as to antimeningococcus serum, antidysentery sera, and diphtheria and tetanus antitoxins. The Third Schedule relates to salvarsan and its derivatives, the Fourth to insulin, and the Fifth to pituitary (posterior lobe) extract. There can be little doubt that the new law will not only protect the public, but will also assist the practitioner, who has hitherto been without certainty or standardisation in administering many of the substances to which the Act applies.

The main points in which the regulations differ from those which were proposed a few weeks earlier in draft form are these. The requirement that a substance be sealed in a previously sterilised glass container before sale is relaxed where products are effectively sterilised by heat after being filled in containers. There is a new Part V., relating to therapeutic substances manufactured for export only, allowing the licensing authority to dispense with the requirements of the regulations if a substance is being exported to a country where manufacture and sale are already regulated. There are differences of nomenclature as to salvarsan and its derivatives. Salvarsan, neosalvarsan, and sulphurosalvarsan, so named as "proper names" for labelling in the draft regulations, give way to arsenobenzene, novarsenobenzene, and sulpharsenobenzene, and the draft proposals as to silver salvarsan and neo-silver-salvarsan are changed. Finally the date of operation of the regulations, which was originally proposed as August 6th next for all purposes, is varied (as already stated) by allowing a further six months' grace in respect of the regulations relating to labelling. The Minister of Health announces also that he has intimated to the Association of British Chemical Manufacturers that in the initial period immediately after August 6th some latitude will be allowed so as to permit the clearance of existing stocks and to familiarise all concerned with the new requirements. Constitutional purists would no doubt prefer to see the law delayed until it can be uniformly enforced, rather than to allow the Ministry to promulgate requirements with a vague intimation that the law need not at present be observed. Such criticisms, however, may be waived in view of the difficulties which the Ministry experienced in getting the Act through Parliament and in view of its success in conciliating the interests affected.

RHEUMATIC FEVER AS AN INFECTIOUS DISEASE.

TAKING as a text A. Hirsch's opinion, reached in 1864, that rheumatic fever deserves an assured place among the acute infective diseases, Dr. R. M. Atwater[1] has examined the mortality statistics of the United States registration area from 1900–23, and is satisfied that they afford fresh evidence of weight that "this disease is one of the communicable infections caused by a living parasite which gains access to the body from without, and which produces a disease picture in which the age, sex, seasonal, racial, and other characteristics are fixed and very close in their resemblance to the well-known epidemic diseases." Dr. Atwater has made a brave attempt to extract information from data that, as he points out, obviously leave much to be desired. Frequent changes in nomenclature at uncertain dates, differences of treatment of the same data by State and Federal statistical offices, and varying precedence given to causes of death are among the difficulties with which he has had to contend. Comparison with age-distribution of the mortality from rheumatic fever in England and Wales and of hospital cases in Montreal shows an excess in the proportion of deaths above 45 in the U.S. registration area, which suggests that many cases of chronic arthritis have been included. The excess at the older ages still existed in the latest figures quoted (1923), though to a less extent than in 1900. In spite of these defects, the U.S. registration area shows a consistent female excess mortality in both the white and coloured population. There is also a higher mortality among the coloured than among the white, although most of the negroes live in the south where rheumatic fever is less prevalent. Dr. Atwater's main argument is based on a comparison in both English and American statistics of the annual variations since 1912 in the mortality from rheumatic fever and the mortality from septicæmia, erysipelas, and puerperal septic diseases. The general resemblance is closer in the data for England and Wales. From the orderliness of the sex and age curves of deaths from rheumatic fever and from their likeness to similar curves for communicable diseases—which hardly amounts to more than a restatement of the fact of orderliness—Dr. Atwater argues "a biological process going on between the host and a parasite which is affected by varying human constitution at different ages." The epidemiological facts brought out by this paper are hardly convincing enough, however, to justify his definite conclusion, quoted above, that acute rheumatic fever is one of the communicable infections caused by a living parasite which gains access to the body from without. Dr. Atwater's data, like those collected in the Medical Research Council's special inquiry,[2] may be regarded as consistent with the theory of infection, but give no definite evidence that it is the true explanation of the facts.

[1] American Journal of Hygiene, May, 1927.

VITAMIN E.

Vitamin E, or the reproductive vitamin as it is called, has always been regarded with a degree of uncertainty, due perhaps to the prima facie improbability that there should exist a vitamin needed both by male and female for reproduction, but which does not appear to be necessary for the non-reproducing adult. But just as those improbable concepts, the growth factors, have ultimately resolved themselves into dietary essentials for upkeep, as well as for growth, so perhaps the reproductive vitamin E will finally share their fate. Indeed, there is some evidence already to hand that this will be the case. H. M. Evans and his co-workers were the first to differentiate vitamin E and to describe the pathological condition to which a deficiency of it gives rise in both sexes of the rat. In the female, conception takes place and gestation begins, but sooner or later the embryos die and are resorbed or sometimes aborted. In the male, degeneration of the testicle takes place, which may be of varying degrees of severity, down to a complete and incurable degeneration of all the seminiferous tubules.

As regards its distribution, the same workers find that vitamin E is present in a number of foodstuffs, including to a small extent butter and cod-liver oil. It is abundantly present in wheat germ and its oil, as well as in lettuce, but it seems to be completely lacking in lard. In wheat-germ oil the vitamin is so concentrated that a daily dose of 25 mg. suffices; the action cannot therefore be attributed to any known vitamin, such as vitamin A, which is also present to a certain extent. The vitamin survives hydrogenation, as in hardened cotton-seed oil, and is regarded as fat-soluble. In their last publication Evans and G. O. Burr suggest that there is a quantitative relation between the amount of certain fats in the diet and the amount of wheat germ which is needed to prevent sterility. When 7·7 per cent. of lard is incorporated in the diet 2·2 per cent. of wheat germ, also incorporated, is enough; but when 22 per cent. of lard is used 2·6 per cent. of wheat germ is not enough. Butter fat does not have this effect, but it is not itself devoid of vitamin E. The action cannot therefore be due simply to excessive fat intake. These workers do not show, though no doubt they possess, evidence that the rats actually ate as much of the high fat diets as they

[2] THE LANCET, March 12th, pp. 552 and 562.

did of the lower ones; their calorie needs would be supplied by smaller amounts of the former, and if their consumption of food were consequently lowered their intake of wheat germ would be correspondingly reduced. V. E. Nelson and his co-workers do not consider that the evidence for the existence of vitamin E is adequate, but J. C. Drummond states that work has been done in his laboratory which fully confirms Evans's work as to the existence of vitamin E. E. V. McCollum and his co-workers not only accept the existence of vitamin E, but they also make an interesting suggestion as to its possible function. They have been troubled for a considerable time by the appearance, among their experimental rats, of an ophthalmia which they feel cannot be due to any lack of vitamin A. At one time they attributed the eye trouble to some error in the salt mixture and called it a salt ophthalmia. In a paper published this year they correlate the ophthalmia with the death of fœtuses on a diet deficient in vitamin E, and regard both as due to an iron insufficiency. They ascribe to vitamin E a function with regard to iron assimilation and state that, on the diet which they use, the ophthalmia and sterility produced by it can be cured either by adding vitamin E or by substituting ferric citrate for the ferrous sulphate previously used. If these results are confirmed, vitamin E takes its place with the other vitamins as a dietary constituent, vital for growth and maintenance.

There is at present little evidence that lack of vitamin E is an important ætiological factor in human disease, but Prof. E. Poulsson, of Oslo, has published an interesting case. An apparently healthy woman, after bearing a normal child followed by a weakly one, had five successive pregnancies in which the child perished just before full term. For the next two pregnancies cod-liver oil was administered liberally and a healthy child resulted in each instance. Whatever may be the lesson to be drawn from this case, cod-liver oil cannot be regarded as a rich source of vitamin E, but Prof. Poulsson suggests its administration in cases of habitual and unexplained abortion.

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THE DETERMINATION OF SULPHUR DIOXIDE IN FOOD.

THE Ministry of Health has decided what foods and articles used in the preparation of food may contain preservatives, and the kinds and amounts of these tolerated substances which may be allowed. This in itself is a task requiring knowledge and discretion. It is, however, one thing to fix a standard or limit and another to enforce it. The quantities allowed are in all cases small, and it is not always easy to determine whether an excess has been added. Sulphur dioxide is volatile, easily oxidised to sulphuric acid, and forms, with many substances likely to occur in foods, condensation products which are non-volatile and fairly stable. The most obvious means of determination is conversion, by oxidation, into sulphate. Here alternatives are possible; either the amount of oxidising agent required may be determined or the sulphate ions when formed may be either precipitated and weighed as barium sulphate or titrated acidimetrically. The former process can be carried out volumetrically; the gravimetric one requires more time and skill. Since, however, 1 part of SO_2 yields about 3·6 parts of $BaSO_4$ it has some advantages. If it were merely a matter of determination of SO_2 in clean aqueous solutions the choice of method would be merely a matter of convenience. The actual substances dealt with in an analytical laboratory do not always present the clear-cut case which is possible in an educational institution, and foods contain various interfering constituents. Since almost all foods contain substances which will react with the usual oxidising agents and few are free from either sulphur compounds which will yield sulphates or from sulphates themselves, it is usually necessary to take advantage of the volatility of sulphur dioxide in order to obtain a clean, sulphate-free liquid. The ease with which sulphur dioxide forms condensation compounds renders something more than simple distillation necessary, whilst its easy oxidisability points to the need of distillation away from air.

A great deal of research, not all of the most convincing kind, has been done on this matter in this country and abroad. A monograph by Dr. G. W. Monier-Williams, issued by the Ministry of Health, contains a bibliography of over 100 papers devoted to sulphur dioxide in foods. The Ministry and Dr. Monier-Williams must be congratulated on having avoided the mind-destroying pitfall of standard methods. There are, it must be admitted, some cases where the substance to be determined, although physically or physiologically definite, is not well characterised chemically or its characteristic forms or compounds are difficult to separate quantitatively or to deal with when separated. In such cases a standard method is necessary in order that comparable results may be obtained by different workers. In other cases the standard method is a sop to intellectual indolence. Critical investigation of the work of others and some well thought-out experimental work has enabled Dr. Monier-Williams to evolve a method of general application in which distillation with hydrochloric acid, in preference to the frequently used phosphoric acid, and oxidation of the SO_2 in the distillate with hydrogen peroxide overcomes some of the difficulties in the way of exact work. The means used to verify the accuracy of the method are described. Some interesting results showing the very small effect which the sulphur in gas used for heating has on liquids digested over gas flames are given. It appears that those who are called upon to examine foods for this preservative may feel a reasonable certainty as to the accuracy of their work if they will pay due regard to the facts set forth in the report. This is matter for congratulation, as both commerce and the public interest may suffer if new enactments are found to be applicable only on a highly speculative basis.

BIRTH TRAUMA AS PROTOTYPE OF FEAR.

IN a letter which we publish in another column a San Francisco correspondent refers to the importance of the trauma of birth in the mental development of the human child. The view that the physical reactions produced by the trauma of birth may stand as a prototype of the emotion of fear has been, as our correspondent points out, reached by the psycho-analytic route. Erasmus Darwin expressed an almost identical view in 1794, when he wrote[1]:—

> As soon as the young animal is born, the first important sensations that occur to him are occasioned by the oppression about his precordia for want of respiration, and by his sudden transition from ninety-eight degrees of heat into so cold a climate. He trembles, that is, he exerts alternately all the muscles of his body, to enfranchise himself from the oppression about his bosom, and begins to breathe with frequent and short respirations; at the same time the cold contracts his red skin, gradually turning it pale; the contents of the bladder and of the bowels are evacuated: and from the experience of these first disagreeable sensations the passion of fear is excited, which is no other than the expectation of disagreeable sensations. This early association of motions and sensations persists throughout life; the passion of fear produces a cold and pale skin, with tremblings, quick respiration, and an evacuation of the bladder and bowels, and this constitutes the natural or universal language of this passion.

If these views are valid, the bodily manifestations of fear can be regarded physiologically as conditioned

[1] Zoonomia, vol. i., Section xvi., p. 148.

reflexes initiated by the birth trauma. The selection of a specific manifestation might then be determined, as in Dr. Strauss's cases, by psychological factors capable of elucidation and resolution by analysis.

VENTILATION AND TEMPERATURE.

THOUGH the need for ventilation has been recognised from remote antiquity, it is only in comparatively recent times that attempts have been made to explain it scientifically. First came the belief, founded on the discoveries of Black and Lavoisier, that the harmful results of overcrowding are due to lack of oxygen and accumulation of carbon dioxide. This idea, plausible as it is, was generally accepted, and has proved so tenacious that it remains the foundation upon which legislation in the textile industries is based. That it is erroneous has, however, been shown by many workers, from Pettenkofer onwards, and a recent review [1] of the literature of this subject shows how far advance has been made. No longer—apart from escape of poisonous fumes—is importance attached to the chemical composition of the air, measured as excess of carbon dioxide or diminution in oxygen, and no longer is it held that ill-effects arise from absorption by the lungs, to which attention was first directed by the alterations in breathing which are observed when ventilation is insufficient. The organ concerned, it is now recognised, is the skin, acting through the heat-regulating mechanism of the body. Hence study has been concentrated, not on the chemical composition of the air, but on its physical characteristics expressed in terms of temperature, humidity, and movement. Comfort, health, and capacity for activity are found to depend largely upon the proper balance between the heat produced by the body within and that which is lost from the skin; any retardation of heat loss causes discomfort and depression, and finally physiological derangement. As temperature rises humidity becomes of increasing importance, because the body, unable to get rid of heat fast enough by convection and radiation, has to rely more and more upon evaporation by means of the sweat glands. At high temperatures, in fact, the body behaves rather like a wet-bulb thermometer and the figure registered by this type of instrument gives a fair idea of the conditions with which it has to cope. The more moisture the air contains the less it can remove by evaporation from the skin, and when the wet-bulb registers more than 80° F. work must cease or heat will be generated faster than it is lost. When 90° F. is reached on the wet-bulb the body will be unable to get rid of the heat produced in the processes needed to carry on life, and its temperature will rise until heat-stroke occurs. Movement of the air, by favouring evaporation, is generally beneficial at high temperatures; but when the air is warmer than the body it becomes disadvantageous, since the air now warms by contact more than it cools by evaporation. At low temperatures the wet-bulb loses its significance in favour of the dry bulb, because evaporation is not the important means by which heat is dissipated and the sweat glands are not in action.

Much attention has been paid to the influence of high temperatures, and the influence of cold has also been studied, though less intensively, as it is easier by exercise or external means to maintain bodily warmth. But what is specially interesting is the determination of an optimum temperature. A constant environment produces, of course, a feeling of stagnation and lacks the power to stimulate. It is found, however, that, on the whole, human activity, measured by industrial output, is at its best at temperatures ranging round 65° F. At this figure there are fewest accidents and least sickness; metabolism is at its lowest and comfort is maximal. The adverse influence of a rise of temperature is found to be greater for each degree of rise than for each degree of fall. The importance of these facts in industry can hardly be exaggerated, for it is usually possible to regulate environmental heat by ventilation or refrigeration. In time to come, domestic and business houses may have a cooling system for the summer, as they now have a heating system for winter.

Efforts are being made to provide the hygienist with devices for estimating the efficiency of ventilation. At present two are under close investigation—namely, Dr. Leonard Hill's kata-thermometer, which records the cooling power of air, and an effective temperature index which comes from United States. These are based on the same fundamental principles and entire agreement has not yet been reached as to which is the more useful. Possibly each has advantages in its country of origin owing to differences in climatic conditions. The kata-thermometer is likely to be used in this country until, if ever, an effective temperature index is worked out experimentally here.

[1] Review of literature on the Physiological Effects of Abnormal Temperatures and Humidities. R. R. Sayers and S. J. Davenport. Public Health Reports of the United States Public Health Service, April 8th, p. 933.

THE WILKINS COMMITTEE.

THE Society of Superintendents of Tuberculosis Institutions has appointed a subcommittee to deal with the after-care of cases leaving these institutions, and also to afford opportunity for superintendents and others to acquire information about candidates suitable for posts as they fall vacant. The members of the Society were, we understand, actuated by the feeling that more effort should be made to induce such institutions to employ tuberculous persons on their staff. It has been found that, being conversant with the daily routine and the accepted line of treatment, they do excellent work and are in general a desirable category of servant. Bringing together would-be employers and those requiring employment should therefore play a helpful part in the after-care of tuberculous patients. Those who have employed such ex-patients at sanatoriums realise the feeling of relief with which they do their work, knowing they are safe and sheltered. At Nayland at the present time 64 out of 150 members of the staff are ex-patients; their number makes it possible to select some of the staff from the point of view of character as well as of health—a matter of real gain. Ex-patients are found suitable for all posts except the heads of departments, where work must sometimes be done under pressure unsuitable for tuberculous people. The committee, which is called after the late Dr. A. G. Wilkins who originated the idea, is making a beginning with tuberculous people, but hopes to extend its efforts later to include cripples from rheumatism and heart disease, and convalescent mental cases. In the first instance the scheme is to be solely in medical hands, but later on employers of labour and other interested persons will be asked to join the committee. For the present, lists of vacant posts will be prepared at intervals and circulated. Dr. Jane Walker is chairman of the committee, and will supply information from its temporary office at 122, Harley-street, London, W. 1.

THE GRACILIS MUSCLE AS SPHINCTER.

WE commented last year [1] on a case in which the gracilis muscle had been used to encircle the female urethra and restore urinary control. Drs. L. P. Player and C. L. Callander now report [2] a case in which they used this technique with success in a man who suffered from urinary incontinence after suprapubic prostatectomy. The patient was readmitted to hospital eight months after the removal of his prostate to teach him control and to clear up a bladder infection. Two surgical attempts to repair the internal sphincter resulted in sloughing of the tissues and a worse state of incontinence than before. Two and a half years after his first operation he was admitted to hospital again and Deming's operation was performed. The authors describe their technique in detail. The gracilis muscle was severed at the level of the internal condyle of the femur, freed up to the entry of its nerve- and blood-supply, and then tunnelled under a

[1] THE LANCET, 1926, i., 873.
[2] Jour. Amer. Med. Assoc., March 26th, 1927.

bridge of intact skin to the perineum. It was sutured with catgut to the corpora cavernosa, the free end being rolled over the corpus cavernosum urethræ and stitched to itself. The catheter and sutures were removed a week after operation and the patient then declared that he could control his bladder, and woke up to pass urine for the first time since his first operation. A month later he was able to control urine while in bed but leaked a little when up and about. For this reason the wound was reopened and, as anticipated, the gracilis was found to be loosely rolled round the corpus cavernosum owing to absorption of the stitches uniting it to the corpora cavernosa. The loop was tightened up, after which he regained complete control in proportion to his physical energy. When very tired he sometimes has to lie down to regain control. In a man of 66 this result is gratifying. Cystoscopy on several occasions has shown that there is no residual urine and that there is distinct voluntary contraction in the transplanted muscle. So great is this power that the orderly was unable to remove a No. 16 soft rubber catheter until the muscle relaxed. It appears that Deming's technique will prove satisfactory for these very trying cases; if it does its inventor will have saved a great deal of distress and inconvenience to the unfortunate sufferers from otherwise incurable incontinence.

A CONFERENCE ON GOITRE.

THE stream of published reports from many parts of the world shows that an immense number of workers are trying to throw light on the ætiology of endemic goitre, and are seeking means of preventing the disease. The investigations and experiments made in Switzerland have been the starting-point of much of this research, and it is fitting that an invitation should come from that country to an international congress, where opinions may be ventilated. The idea of such a conference was first put forward in 1923 by the directors of the surgical clinics of Basle and Berne, Prof. G. Hotz and Prof. F. de Quervain. The project could not be realised at once, but difficulties have now been overcome, and the Swiss Goitre Commission, having sent invitations to a number of foreign authorities, has arranged for the conference to be held at Berne from August 24th to 26th of this year. It will not be a general congress, but is called "a simple meeting of men of science who have made researches connected with the study of the problems of goitre." Amongst those who are to take part are Prof. L. Aschoff (Freiburg i/B), Prof. C. Wegelin (Berne), Dr. David Marine (New York), Prof. H. S. Plummer (Rochester, U.S.A.), Prof. Eiselsberg (Vienna), Prof. F. de Quervain (Berne), Prof. L. Bérard (Lyons), Lieut.-Colonel R. McCarrison (I.M.S.), Prof. B. Galli-Valerio (Lausanne), Dr. E. Bircher (Aarau), Prof. J. Wagner-Jauregg (Vienna), Dr. Muggia (Sondrio), and Prof. W. Silberschmidt (Zürich). On August 27th Prof. de Quervain will give a demonstration at the surgical clinic. The President of the Swiss Goitre Commission is Dr. H. Carrière, and the congress will be held at the University of Berne.

AFTER the death of Sir William Macewen, professor of surgery in the University of Glasgow from 1892 to 1924, a committee was formed to raise a fund to commemorate his life and work. The first purpose of the fund was to present a bust to the University, a replica being given to Lady Macewen. The second purpose was the establishment of a Macewen memorial lecture, and the third the foundation of a Macewen Medal in the class of surgery. The busts have been presented and the first award of the medal has been made. The first memorial lecture is to be delivered by Prof. Harvey Cushing, C.B., M.D., of Harvard University, in the Zoological Lecture Theatre of the University on Tuesday, June 21st, at 3 P.M. The lecture will be open to past and present students of medicine and to others who may be interested. Subscribers to the Foundation Fund are specially invited.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXXVIII.

THE TREATMENT OF SCARLET FEVER.

WHETHER the patient is isolated in hospital or at home, the general lines of treatment are the same. The room must be well ventilated with as much light as possible. A warm, stuffy room is bad, and, as long as the patient is warm in bed, conditions approaching open-air treatment are best—especially in septic cases. Daily tepid sponging with soap and water is necessary while the patient is in bed. During convalescence warm baths may be taken. The bowels must be attended to; an enema the first day or so, as long as there is a temperature, and then simple aperients. At the time of the rash the patient must be comfortably warm in bed—preferably among blankets—and should have a soft woollen garment next the skin. A couple of hot-water bottles are usually sufficient, but more may be necessary if the rash is not coming out well and is poor in colour. If this is not sufficient hot packs or mustard packs may be given to bring the rash out and a little ice to the head if the temperature rises above 104° F. Whisky is useful in sharp cases as a stimulant, or brandy if the patient is sick. Sleep is important, and this may be induced by tepid sponging and warm drinks such as toddy. If this is not enough a little bromide or paraldehyde may be given. The paraldehyde is best given by the rectum. Morphia may be needed if the patient is very restless, but it is not always well borne. At the end of three weeks the patient is allowed to sit up wrapped in blankets for a few days before being dressed. The risk of the individual catching cold must not be forgotten. Drugs play a small part in the treatment of scarlet fever. Diaphoretics are really unnecessary and the Milne treatment has now been given up.

Diet.

Milk is sufficient at first. After the temperature falls give porridge, milk puddings, &c., and later fish; after about three weeks increase to an ordinary diet. In septic cases the diet must be such as to maintain the strength of the patient. In nephritis it is best to restrict the diet to milk or arrowroot, &c., with occasionally some stewed fruit and cream. Fluids should be given freely in all cases of scarlet fever.

The Care of the Mouth, Nose, and Throat.

In ordinary simple cases of scarlet fever in an adult a mild antiseptic gargle is sufficient. A teaspoonful of liq. thymol co. in a glass of warm water is a pleasant mouth-wash and gargle. The child requires a little more care, as it is unable to attend to the toilet of the mouth itself. The throat may be left alone, but the tongue and mucous membranes should be thoroughly cleansed with swabs of cotton-wool dipped in a mild antiseptic solution such as thymol solution, using a swab-holder or the index-finger sheathed in a thin layer of cotton-wool. The mucous membranes may then be swabbed over again in the same way with a solution of boroglycerine. Finally, the tongue and lips are anointed with a mixture of boric ointment and vaseline flavoured with peppermint to keep them moist and soft. Ill patients, whether adults or children, should have the toilet of the mouth thus attended to after feeds.

Septic and Toxic Cases.

If the case is a septic one, with profuse nasal discharge and patching on the tonsils, the nose and throat may be gently irrigated or sprayed with mild lotions such as boric lotion, eusol, thymol, or normal saline. Actual swabbing of the fauces is sometimes necessary, but in a restless patient this form of local treatment is probably unwise. The discharge from the nose should be mopped up and not

allowed to stain the pillows and sheets. In septic cases sleep is essential and to produce it, to stimulate the appetite, and to improve the condition of the patient generally, nothing is better than open-air treatment—even in winter.

In toxic cases the usual methods must be adopted to get the rash out and salines may be given either rectally, subcutaneously, or intravenously, but the patient often fights against all such endeavours to assist him. Stimulants such as whisky or brandy are given and hypodermic injections of camphor in oil or—better still—caffeine-sodio-salicylate. Unfortunately, the outlook in toxic cases is extremely bad. Vaccines have been tried, especially for septic cases, but have not proved of much use; neither have injections of polyvalent serum been very successful either in septic or toxic cases, except in a few instances where the particular serum seemed to suit the patient, and given in large doses of 100 to 150 c.cm. In toxic cases the administration of the whole blood of a convalescent scarlet fever patient —as recommended by Zingher—has been of great benefit, but this form of treatment, too, has often been disappointing. It is certainly worth trying; 100 c.cm. at least of the donor's blood is withdrawn rapidly in sterile syringes which have been immersed in 1 per cent. sodium citrate solution, and injected intramuscularly into the thigh of the patient. In favourable cases there is—following the injection—a fall of temperature and pulse-rate, and the patient rapidly improves.

Scarlet Antitoxin Treatment.

Evidence is increasing that scarlet antitoxin, when injected early enough and in sufficient dosage, blanches the rash, lowers the temperature, and improves the general condition of the patient, so shortening the disease and lessening the likelihood of complications. The most marked benefit is seen in the restless semi-delirious patient of the toxic type—the antitoxin apparently neutralising the toxæmia. In the septic case improvement often follows the injection of the antitoxin though complications may still result—especially if the serum is not given sufficiently early. In many patients the antitoxin apparently lessens the subsequent desquamation, but in others this is not so, probably because the serum is given too late. Concentrated scarlet antitoxin should be given intramuscularly in doses of 10 to 40 c.cm. or more to moderately severe cases. In mild cases 10 c.cm. is probably sufficient, but large amounts must be given in toxic cases and preferably intravenously, if possible; failing this intramuscularly into the outer aspect of the thigh. Concentrated antitoxin is better than unconcentrated serum as there will be less risk of serum reactions following in the shape of rashes which are sometimes accompanied by slight temperature; the rashes are mainly urticarial in type.

The Care of the Patient during Convalescence.

Otitis media should be treated with fomentations which are soothing and often hasten discharge from the ear. Paracentesis should not be delayed if it seems likely to be called for. *Otorrhœa* requires gentle douching with warm boric lotion or hydrogen peroxide —many prefer merely to mop up the discharge and consider douching or syringing dangerous. A *superficial mastoid abscess* requires a simple incision right through the periosteum, but if the mastoid cells are involved a more radical operation is called for. *Rhinitis* is treated on general lines. If it is due, as it often is, to a K.L.B. infection, 1500 units of antitoxin will dry up the rhinorrhœa. If the otorrhœa or rhinitis continue and tend to become chronic, then the removal of the tonsils and adenoids is the only thing to do and often clears up the discharges. *Adenitis* is treated by fomentation and, if necessary, by an incision where the abscess, which sometimes results, is ripe. *Arthritis* seldom requires treatment other than warmth to the parts, unless suppuration occurs, when drainage is necessary. *Nephritis* is treated in the usual way by promoting diaphoresis and keeping the bowels well open with Epsom salts or jalap (dose 30–60 g.). If convulsions occur, bloodletting should be performed. The urine, especially during the nephritic period (sixteenth to twenty-sixth day) requires to be examined daily, as there is always the danger of a sudden toxic nephritis occurring. Only a trace of albumin may be found in routine examination, but the patient may die suddenly in a few hours with a high temperature. Slight adenitis often precedes nephritis, and vomiting is a danger-signal. The majority of cases of nephritis recover if treatment is early and prompt, and chronic nephritis is rare. A. Osman and H. Carter have recently suggested the administration of alkalies as a prophylactic against this complication.

The Dick Test and the Schultz-Charlton Reaction in Scarlet Fever.

The majority of patients suffering from scarlet fever give a positive Dick test if the test is performed during the height of the rash. This is replaced by a negative reaction during convalescence, the antitoxin produced during the disease being apparently specific for the toxins of the *Streptococcus hæmolyticus*. The serum of a convalescent or scarlet antitoxin, if injected intracutaneously at the height of the rash, is capable of neutralising the toxin in the skin, and blanching occurs, giving a positive Schultz-Charlton reaction. If, on the other hand, an individual with a rash shows a negative Dick test and a negative Schulz-Charlton reaction, then the rash is not likely to be one of scarlet fever, neither will it be due to scarlet fever if with a negative Schultz-Charlton reaction a positive Dick test is shown right from the beginning of the illness to the end of convalescence. The serum of such an individual, too, will not blanch a definite scarlet rash.

The Dick test shows that about 60 per cent. of children between 1 and 5 years, and 35 per cent. between 5 and 10 years are susceptible to scarlet fever. Nurses in fever hospitals who are Dick-positive reactors should be actively immunised against scarlet fever, and the time will undoubtedly come when large numbers of children, too, will have to be protected. Scarlet fever antitoxin can confer a passive immunity lasting only a few weeks, but an active immunity, lasting for 18 months to three years at least, may result from injections of increasing amounts of the toxin of the streptococcus of scarlet fever. A total injection of 20,000 skin test doses is recommended, beginning with one of 250 such doses. Children under 5 years of age should be immunised against both scarlet fever and diphtheria without any preliminary Dick and Schick tests, but after 5 years such tests are necessary to pick out the positive reactors.

The Schick Test and Diphtheria in Scarlet Fever.

If a patient during the time of the rash in scarlet fever has a faucial lesion suggestively diphtheritic and shows a positive Schick test, then it is wise to administer diphtheria antitoxin. If, on the other hand, a negative Schick reaction occurs, the faucial lesion is almost certainly septic in nature, even though it involves the uvula. Even if diphtheria antitoxin is administered at the same time as the Schick test is performed, a negative reaction may be taken as showing that the patient is not suffering from concurrent diphtheria, and is really immune to that disease. If during the convalescence of scarlet fever a patient develops speckling or patching on the tonsils, and that individual is a Schick positive reactor, then it is wise to administer a small dose of diphtheria antitoxin which can be repeated if necessary. A negative reactor with speckling or patching on the tonsils may safely be left alone. If tonsils and adenoids have to be removed for any reason during the convalescence of scarlet fever, 1500 units of antitoxin should always be injected to confer a passive immunity if the individual is a positive reactor to the Schick test. On the other hand, if the patient is known to give a negative Schick reaction, no diphtheria antitoxin is necessary, and anything developing later on the fauces may be regarded as merely septic.

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Special Articles.

STEPHEN HALES, D.D., F.R.S.,

PHYSIOLOGIST AND BOTANIST, 1677–1761.

A Dissertation delivered at Corpus Christi College, Cambridge, on June 16th, 1927,

BY A. E. CLARK-KENNEDY, M.D., M.R.C.P.,

FELLOW OF THE COLLEGE; ASSISTANT DIRECTOR OF THE MEDICAL UNIT, THE LONDON HOSPITAL.

Stephen Hales, a grandson of Sir Robert Hales, was born at Bekesbourne in Kent on Sept. 17th. 1677. Sir Robert's eldest son, Thomas, had married Mary, heiress of Richard Wood, of Abbots Langley in Hertfordshire; Stephen was their sixth son. Having been properly instructed in "grammar learning," he was sent up to Cambridge and admitted a pensioner of this College in 1696. Intended for the Church, he studied divinity. Taking the degree of Master of Arts in 1703, he was ordained and elected a Fellow of the College in the same year. Just after Hales had been elected to his Fellowship, William Stukely came, as a scholar, to Bene't College. Stukely, an enthusiastic naturalist, made physic his principal study, to become a Fellow of the College of Physicians and well known as an antiquary in after life. With this undergraduate, some years his junior, Hales formed an intimate friendship. Together they rambled over "Gog-Magog hills and Cherry-Hunt-Moor," collecting "simples," hunting for fossils in the chalk pits, and catching butterflies, "having contrived an instrument for taking them." Together they studied anatomy, dissecting dogs and other animals. They also attended the public lectures that Vigani, first professor of chemistry, gave in the "Cloysters" at Queen's College, and went to see "chymical" experiments he performed in the room over the gateway at Trinity, which had been the laboratory of Sir Isaac Newton. Hales also applied himself to astronomy, and having acquired a "perfect knowledge of the Newtonian system," invented a mechanical model to demonstrate the movements of the planets.

In 1709 Hales was appointed Minister of Teddington in the county of Middlesex. Soon after he commenced a long series of researches on the physiology of plants and animals. By nature Hales was always a biologist, but at Cambridge he had been well grounded in the Newtonian physics and astronomy of his day. There, too, to good purpose, he had attended Vigani's lectures, and repeated many of Robert Boyle's experiments, learning the value of the experimental method. "Though we can never hope to attain," he wrote, "to the complete knowledge of the texture, or constituent frame and nature of bodies, yet may we reasonably expect by this method of experiments, to make farther and farther advances abundantly sufficient to reward our pains. And though this method be tedious, yet our abilities can proceed no faster; for as the learned author of the 'Procedure of Human Understanding' observes:—

> 'All the real true knowledge we have of nature is intirely experimental, insomuch that, how strange soever the assertion seems, we may lay this down as the first fundamental unerring rule in physics, *That it is not within the compass of human understanding to assign a purely speculative reason for any one phenomenon in nature.*'

So that in natural philosophy we cannot depend on any mere speculations of the mind: we can only with the mathematicians, reason with any tolerable certainty from proper data, such as arise from the united testimony of many good and credible experiments."

Hales therefore applied the experimental method, and quantitative methods in particular, to the study of biology, as rigidly as Newton, Boyle, and others had used it in the elucidation of the laws of physics and chemistry. Harvey had inferred the circulation of the blood from anatomical observation, and then confirmed it by experiments on living animals. Hales proceeded differently. From the start he applied his knowledge of physics and mechanics to the problems of physiology. Thus, not only did he become a great experimental biologist, but one of the outstanding figures in the foundation of the mechanistic physiology of to-day.

His Work on the Circulation.

To Hales, primarily a biologist, but trained as a physicist, the circulation of the blood, discovered rather less than a century before him, must have presented a fascinating study. It is therefore not surprising that his first scientific endeavour was to make a complete quantitative investigation of the dynamics of the circulation. "Since we are assured," he wrote, "that the animal fluids move by *hydraulic* and *hydrostatical* laws, the likeliest way therefore to succeed in our inquiries into the nature of their motions, is by adapting our experiments to those laws." He therefore devised his "hæmastatical" method, which consisted of the application of the principle of the manometer to animal physiology, and performed a vast number of vivisection experiments of great technical difficulty, not in a well-equipped laboratory, but in the parsonage at Teddington in pre-anæsthetic days! By tying tubes into the arteries and veins of living animals he was the first man to record the blood pressure. In so doing, not only did he advance our knowledge of cardio-vascular physiology by a definite and important step, but at the same time laid the foundation of an important clinical method in the study and diagnosis of disease. For this performance Hales is justly famous. But, in addition, he investigated almost all the mechanical aspects of the circulation, and made a more complete study of cardio-dynamics than even Lower had done before him. His description of this branch of physiology is so complete and quantitative, so essentially modern in all its tendencies, that it reads like a chapter in a present-day text-book. By recording the pulse-rate during life, and then injecting the heart with wax, he computed the circulation rate in horses, cattle, deer, and dogs. He showed that in large animals the blood flow is relatively less than in small, but, in the absence of a true conception of respiration and metabolism, he failed to realise the significance of this result. He estimated the actual velocity of the blood stream in the different arteries and veins. He measured the velocity of the blood in the tissue capillaries by observation with a microscope, and compared it with indirect calculations of the velocity of the blood in those of the lungs. Studying blood flow in the tissues, he estimated the capillary blood pressure, and demonstrated vaso-constriction by cold, vaso-dilatation by heat. Lastly, by pointing out that the heart responds to increased venous return by increased systolic output, he laid the foundation of the conception now known as "Starling's Law."

His Work on the Physiology of Plants.

Hales was essentially a comparative physiologist. He alternated between experiments on plants and experiments on animals. Observations on the physiology of plants suggested corresponding experiments on animals. Observations on animals suggested corresponding experiments on the physiology of plants.

> "About twenty years since," he writes, "I made several hæmastatical experiments on dogs, in order to find out the real force of the blood in the arteries: at which times I wished I could have made the like experiments to discover the force of the sap in vegetables; but dispaired of ever effecting it, till by mere accident I hit upon it, while I was endeavouring to stop the bleeding of an old stem of a vine, which was cut too near the bleeding season, which I feared might kill it. Having tied a piece of bladder over the transverse cut of the stem, I found the force of the sap did greatly distend the bladder; whence I concluded, that if a long glass tube were fixed there in the same manner, as I had before done to the arteries of several living animals,

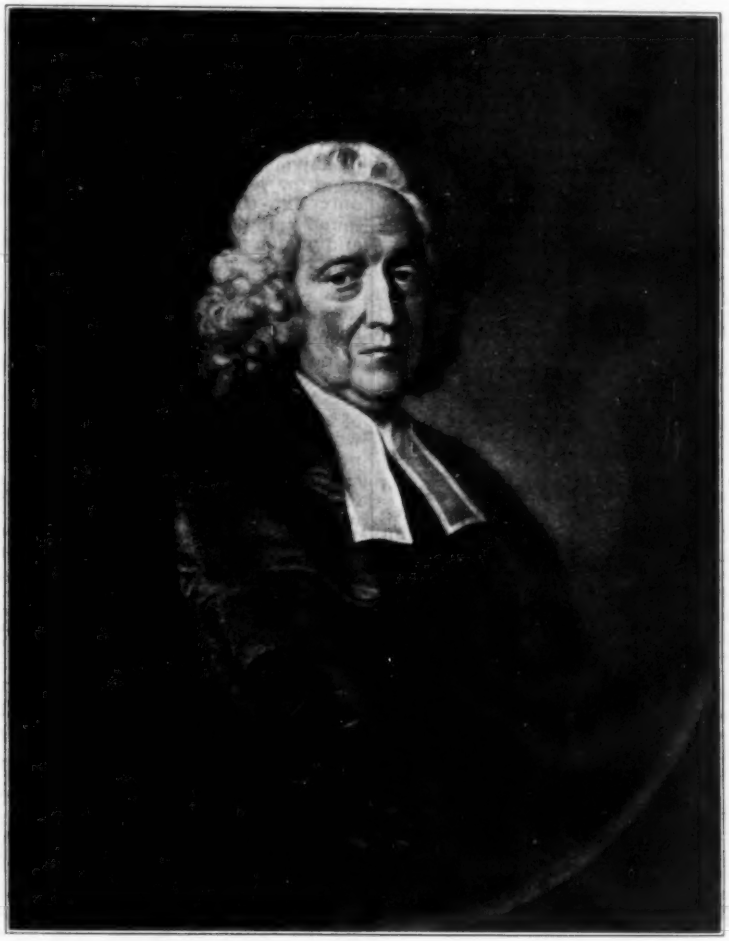
I should thereby obtain the real ascending force of the sap in that stem, which succeeded according to my expectation: and hence it is, that I have been insensibly led on to make farther and farther researches by variety of experiments."

Applying this method, he found the sap pressure in the vine in the bleeding season to be "five times greater than the force of the blood in the great crural artery of a horse; seven times greater than the force of the blood in the like artery of a dog; and eight times greater than the blood's force in the same artery of a fallow doe."

In the field of physiological botany Hales was certainly a pioneer, as he made the first proper scientific investigation of the flow of sap in plants and trees. As in the case of his work on the circulation, this study was not only qualitative but also quantitative. He measured the rate of transpiration of water from unit surface area of leaves, the rate of absorption of water by unit area of root surface, and calculated the rate of flow of sap along the stem and branches. He compared the "perspiration rate" per unit area of surface of the sunflower with that of man. He measured the sap pressure in stems with, and in stems without, their leaves and branches. Finding that the sap pressure was upwards under all circumstances, he argued against the current theory of a circulation of the sap, and attributed its elevation to transpiration by the leaves, aided at certain seasons by a force exerted by the roots. Of this work he wrote, "I have been careful in making, and faithful in relating, the results of these experiments; and wish I could be as happy in drawing the proper inferences from them." But his theory is now regarded as correct in its main essentials.

Hales also invented the present-day method of studying the growth of plants; that of marking stems and leaves at equal intervals. These experiments of his are of particular interest as they led him to perform a fundamental experiment on the growth of the bone. "The wetter the season," he wrote, "the longer and larger shoots do vegetables usually make; because their soft ductile parts do then continue longer in a moist tender state: but in a dry season the fibres soon harden, and stop the further growth of the shoot." Then surely a triumph of reasoning in comparative physiology, as the truth of his prediction was established by his subsequent experiment, which was as follows:—

"As in vegetables, so doubtless in animals, the tender ductile bones of young animals are gradually increased in every part that is not hardened and ossified; but since it was inconsistent with the motions of the joints to have the ends of the bones soft and ductile, as in vegetables, therefore nature makes a wonderful provision for this at the glutinous serrated joining of the heads to the shanks of the bones; which jointing, while it continues ductile, the animal grows; but when it ossifies, then the animal can no longer grow: as I was assured by the following experiment—viz., I took a half-grown *chick*, whose leg-bone was then two inches long; with a sharp-pointed iron, at half an inch distance, I pierced two small holes through the middle of the scaly covering of the leg and shin-bone; two months after I killed the *chick*, and upon laying the bone bare, I found on it obscure remains of the two marks I had made at the same distance of half an inch: so that that part of the bone had not at all distended lengthwise, since the time that I had marked it; notwithstanding the bone was in that time grown an inch more in length, which growth was mostly at the upper end of the bone, where a wonderful provision is made for its growth at the joining of its head to the shank, called by anatomists *symphysis*."



THE REVD. STEPHEN HALES, D.D.,

Clark of the Closet to Her Royal Highness the Princess Dowager of Wales.—F.R.S. and Member of the Academies of Sciences at Paris and Bologna. Aged 82.

(From the mezzotint by McArdell after the portrait by Thomas Hudson in the National Portrait Gallery.)

This experiment, usually attributed to John Hunter born in 1728, was actually performed by Hales some years before that date. His researches were soon to receive the recognition they deserved. In 1718 he was elected a Fellow of the Royal Society on the same day as the friend and companion of his Cambridge days, William Stukely.

His Religion.

It may seem remarkable that scientific work like this should have been performed by a country parson.

But in the study of pure science, though he sought for mechanical explanations always, Hales found confirmation of his faith. No inkling of any conception of evolution ever crossed his mind. The world had been created by God just as Hales found it.

"Nature works according to the laws established at her first institution," he wrote. "The study of nature will ever yield us fresh matter of entertainment, and we have great reason to bless God for the faculties and abilities he has given us, and the strong desire he has implanted in our minds, to search into and contemplate his works, in which the farther we go, the more we see the signatures of his wisdom and power, everything pleases and instructs us, because in everything we see a wise design. . . . The further researches we make into this admirable scene of things, the more beauty and harmony we see in them: and the stronger and clearer convictions they give us, of the being, power and wisdom of the divine Architect, who has made all things to concur with a wonderful conformity, in carrying on, by various and innumerable combinations of matter, such a circulation of causes and effects, as was necessary to the great ends of nature."

Hales was an ardent parish priest; he served his parish with the same energy and zeal as he prosecuted his scientific experiments. He made the women of his parish do public penance for irregular behaviour. He prevailed upon the Lord of the Manor to enlarge the churchyard. He arranged for a new parish water-supply. He caused a lantern to be erected on the church tower

"in which to hang a loud bell to be heard at a much greater distance, not only for the benefit of the serious and the well disposed, but also as a constant memento to the careless, the negligent, and the profane, who with the wicked in Job are but too apt to say: *Who is the Almighty that we should serve him? And what profit should we have if we should pray unto him?*"

On this bell Hales ordered the words "Worship God" to be inscribed. His church was soon too small to accommodate all those who would come to hear him preach. He therefore built a new aisle, and replaced the old wooden tower by a brick one. The money for these alterations was largely raised by the sale of pews, which were leased to their prospective owners, their heirs and assignees for ever, and all for the sum of 4*s*. 3*d*. the square foot! But, in addition, Hales contributed £200 himself. This information is gleaned from the Teddington parish registers in which he also made the following quaint entries. "John Rolt, who was murdered in fighting for the maypole, buried May 23rd, 1710. James Parsons, who had oft eat a shoulder of mutton and a peck of hasty pudding at a time which caused his death, buried March 27th, 1744, aged 35." Here too is recorded the one tragedy of his life. In 1720 he had married Mary, daughter of Dr. Richard Newce, of Much Hadham, Hertfordshire. But his wife died without issue just a year later, and in the register he had to write, "Mary Hales, my dear wife, was buried Oct. 10th, 1721."

His Character.

Of his character let one of his contemporaries speak: "He possessed a native innocence and simplicity of manners, which the characters of other men, and the customs of the world could never alter; and though he often met with many unworthy objects of this kind and uncharitable offices, yet they never once lessened his natural and unwearied disposition of doing good and relieving distress. His temper, as well as the powers of his understanding, were happily fitted for the improvement of natural philosophy, possessing, as he did, in an uncommon degree, that *industry and patient thinking*, which Sir Isaac Newton used modestly to declare, was his own only secret by which he was enabled so fortunately to trace his wonderful analysis of nature. Dr. Hales began his inquiries into natural knowledge very early in life, and he continued them uniformly as his darling amusement, being engaged in experiments until a few weeks of his death. His industry had likewise this farther excellence, that it was always pointed at the general good of his fellow creatures, agreeable to the unlimited benevolence of his heart; and being animated with the success of some of his more useful discoveries, his knowledge appeared to everybody near him to feed his mind with a nourishment that gave him, in decline of life, and even in its last stages, that vigour and serenity of understanding, and clearness of ideas, which so few possess, even in the flower of manhood: and which he used often to say, he valued as the most perfect of all human pleasures. There are two things in his character which particularly distinguish him from almost every other man: the first was, that his mind was so habitually bent on acquiring knowledge, that, having what he thought an abundant income, he was solicitous to avoid any farther preferment in the church, lest his time and his attention might thereby be diverted from his other favourite and useful occupations. The other feature of his character was no less singular: he could look even upon wicked men, and those who did him unkind offices, without any emotion of particular indignation; not from want of discernment or sensibility, but he used to consider them only like those experiments, which, upon trial, he found could never be applied to any useful purpose, and which he therefore calmly and dispassionately laid aside."

His Work on the Chemistry of Respiration.

But to return to his science. An accidental observation, that bubbles of air ascended with the sap, was responsible for Hales leaving the comparatively simple problem of the circulation of the blood, to attack a much more difficult subject—the chemistry of respiration. Any account of his work in this field would be meaningless without some statement of the position of knowledge of this subject in his day. Galileo and Newton had already made physics an exact science. But chemistry, a long way behind, remained an empirical and largely speculative study. The conception of chemical elements had not yet been formed; a logical formulation of chemical compounds was not yet possible. Chemical substances were still described and classified according to their properties. In 1660 Robert Boyle had demonstrated that a candle became extinguished, and that an animal died when placed in an evacuated vessel. Nine years later Lower discovered that blood takes up air. At about the same time Mayow, of All Souls, but for whose untimely death the history of science might read very differently, came to the conclusion that it was not the whole air, but a part of it only, which was essential for respiration and combustion alike; this fraction he called the "spiritus nitro-æreus." Thus Mayow virtually discovered oxygen, and laid the foundation of a true conception of animal heat, when he supposed that this arose from the combination of his nitro-æreal spirits with the sulphurous particles of the blood. Mayow clearly realised that a part of the air went into combination with the blood, but he failed to realise that anything came out. His work, however, received but scant attention, and 30 years later knowledge was put back over a century, when Stahl, failing to make the necessary distinction between matter and energy, introduced his phlogiston theory. According to this conception, which dominated biology and chemistry for over a hundred years, when a substance burned, phlogiston departed from it; the body suffered a loss, it became dephlogisticated. Stahl, rejecting the idea that animal heat was due to chemical action, returned to the old view that it arose from friction of the blood in the vessels, while his pupil Haller, writing only a few years before Hales died, denied that air entered into combination with the blood, so completely had the work of Mayow and Lower been neglected. Not till 1754 did Black deal his death-blow to the phlogiston theory when he prepared carbon dioxide, and not till 20 years after Hales's death, in his eighty-fourth year, did Lavoisier enunciate the true principles of respiration, combustion, and animal heat.

Applying his "statical method," Hales demonstrated that plants absorb considerable quantities of "air." By distilling vegetable substances he showed that plants contained "air." He came to the con-

clusion that "air" enters into the constitution of plants, and that an important function of the leaves was absorption of this form of nourishment. "It is by this amphibious property of air," he wrote, "that the main and principal operations of nature are carried on"; and then this significant sentence: "May not light also, by freely entering the expanded surfaces of leaves and flowers, contribute much to the ennobling the principles of vegetables?" As Michael Foster pointed out, Hales was the first man to give a clear enunciation of the existence of gases in both a combined and a free state.

True to his comparative physiology again, from absorption of air by plants he turned his attention to respiration in man. After performing a number of experiments on combustion without much success, he repeated Mayow's experiment on the respiration of animals. Mayow had shown that animals absorb a part of the air they breathe, but Hales carried things a step further, when he came to the conclusion that respiration in some way modifies the properties of the air left over so as to make it unfit for life and for combustion. Thus he was led to experiment on himself, and to perform the first re-breathing experiment. Taking a well-softened bladder, and closing his nostrils, he proceeded to breathe in and out of it. "In less than half a minute," he wrote, "I found a considerable difficulty in breathing, and was forced after that to fetch my breath very fast; and at the end of the minute, the suffocating uneasiness was so great, that I was forced to take away the bladder from my mouth." Then, in an attempt to find "some means to qualify and rebate the deadly noxious quality of these (expired) vapours," he constructed a more complicated form of re-breathing apparatus with inspiratory and expiratory valves, so arranged that his expired air had to pass through diaphragms of cloth before being inspired again. He could re-breathe the air contained in this apparatus for one and a half minutes only when there were no diaphragms. When, however, these were moistened with a solution of "sal tartar," and then replaced, re-breathing could be continued for five to eight minutes. Moreover, the diaphragms increased in weight to a greater extent than he could account for by absorption of water only! If Mayow can be said to have discovered oxygen, surely Hales described carbon dioxide! Throughout Hales's writings there is no mention of the phlogiston theory. By this silent refusal to follow Stahl, he kept alive the spark of truth that Mayow had lit, to be rekindled more than a century later by Black, Priestly, and Lavoisier. It is almost impossible to conceive of the perspective of Hales's outlook on these problems. But if only he had followed Mayow a little more literally, and conceived, as he had, of different kinds of gases, instead of one "air" with variable properties, he might well have arrived at a true conception of respiration. Be this as it may, Hales's researches had a great practical outcome in his work on ventilation.

Prince Frederick of Wales was in the habit of paying him visits in his laboratory at Teddington to see these curious experiments in which he was almost constantly engaged. The Princess of Wales, mother of George III., also had considerable regard for him, and through her influence he was appointed a Canon of Windsor by the King.

"But declining to accept it, he immediately waited upon his Royal Patroness, and prevailed upon her to waive the honour so kindly intended for him; preferring his retirement at Teddington to any other situation, as being more favourable to his philosophical persuits. His circumstances, he said, were such as entirely satisfied his desires, and an ampler income would only be a greater encumbrance."

Later, however, he accepted the appointments of Clark of the Closet to the Princess Dowager, and Chaplain to the young Prince, her son.

His Temperance Campaign.

In the early part of the eighteenth century the introduction of gin had given a new impetus to drunkenness. In the streets of London gin-shops invited passers-by to get drunk for a penny, dead drunk for twopence. Hales was not a "teetotaler" in the modern sense; indeed, he advocated the drinking of wine. But against this growing social evil he launched a vigorous campaign, when in 1734 he published an anonymous pamphlet entitled "A Friendly Admonition to the Drinkers of Brandy and other Distilled Spirituous Liquors." Two years later he was associated with a number of physicians in a tract entitled "Distilled Spirituous Liquors, the Bane of the Nation," a tract to which Fielding referred, when, in 1751, as a Bow-street magistrate, he urged the legislature to enact some measure of prohibition. A month later Hogarth published his print, "Gin Lane," designedly produced at so low a price as to be within the means of all. Forced into action, Parliament passed a Bill "For Restricting the Sale of Spirituous Liquors," and some of its provisions are in force to this day. This temperance campaign afforded him considerable satisfaction in the closing years of his life. To the Rev. William Henry he wrote as follows:—

"Tho' I thank God, that I have been blessed with Success in promoting several Things which will be of a lasting Benefit to Mankind, yet nothing I have done, has given me near the Satisfaction, that the public Testimony, which I have for 26 Years past borne against these infernal Spirits, ten different Times, has given me: And as I intend soon to begin to print my second Volume on Ventilators, I have in the strongest Terms expostulated on the Subject; hoping that as Ventilators are coming into more and general Use, so my Book on that Subject will probably be proportionately dispersed about the World, In which I have given my last dying Testimony against them, I being this Day, I bless God, *Eighty years* old."

Mrs. Stephens's Medicines.

In contrast to his exact science we now turn to an amazing episode in his career. A certain Mrs. Joanna Stephens, daughter of a gentleman of good estate and family in Berkshire, accidentally discovered a method of dissolving the stone. Many persons afflicted with the distemper of the stone received considerable relief from Mrs. Stephens's medicines, and among them a no lesser personage than the Postmaster-General. In the year 1737 the cures performed by her medicines were so numerous and so well attested that the speedy publication of them was deemed to be of great importance to mankind. Accordingly, after an attempt to raise the money by public subscription had failed, Mrs. Stephens was advised to apply to the House of Commons for a reward when she should declare the secret of her medicines. The necessary Bill was brought in, passed both Houses and received the Royal Assent on June 14th, 1739. By this Bill it was enacted that the sum of £5000 should be applied and paid to the said Joanna Stephens when she had divulged the nature of her medicines and her methods of preparing the same, and when the trustees appointed under the Act had satisfied themselves of the utility, efficacy, and dissolving power thereof. The 30 trustees included the Archbishop of Canterbury, the Lord Chancellor, the Lord President of the Council, the Lord Privy Seal, the Lord Chamberlain, the Bishops of Oxford and Gloucester, the Speaker of the House of Commons, a number of noblemen, gentry, physicians, and surgeons, and the Rev. Stephen Hales. Mrs. Stephens at once divulged the secret of her medicines to the Archbishop. These consisted of egg-shells, snails, and swines-cresses, burned to a blackness until the snails had done smoking, herbs, soaps, and honey! On March 5th the trustees met in the House of Lords. Four persons appeared before them who had taken Mrs. Stephens's medicines. The physicians and surgeons testified with one accord to the completeness with which the distemper of the stone had been eradicated. The trustees signed the necessary certificate required by Act of Parliament, and Mrs. Stephens duly received her reward of £5000 at the Exchequer. And what part did Hales play in this remarkable affair? He had already made numerous

unsuccessful attempts himself to discover a safe solvent for the stone. So when Mrs. Stephens's medicines came along he was quick to put them to some sort of experimental test. Against his better judgment he persuaded himself of their dissolving power in vitro, and then, too readily, accepted the convincing testimony of the men of physic, in whose province, as he so often said, it was not for him to meddle. In 1739 he was awarded the Copley Medal of the Royal Society, not for his classical experiments on the physiology of animals and plants, but for the least successful and least creditable of all his scientific endeavours—his work on the calculus!

His Applied Science.

This episode, which had brought him both into public affairs and into the field of clinical medicine, seems to have been a turning-point in his work. Being intimately associated with a number of seafaring persons, and learning the various hardships they were compelled to endure on long voyages, he determined, out of the benevolence of his disposition, to make a definite attempt to do something towards ameliorating the conditions of life of sailors at sea. So Hales now leaves his academic biology to become, as we shall see, a master of applied science. He invented methods of purifying distilled water and salting animals whole. He advocated the addition of acid to keep fresh water sweet, and the use of burning brimstone, not only for the prevention of "weevil and meggots" in ship's biscuit, but for preventing the rise and spread of "infectious distempers." Some of his methods, or the principles on which they were based, were not altogether original. Some of the practices he advocated were of doubtful utility. But the value of this work of his lay, not so much in what he did, but in the fact that he never ceased forcing scientific methods on the attention of the Admiralty. He must have been regarded as an intolerable nuisance at first, to be laughed at by some, scorned by others. To such treatment, however, he was happily immune. Whether the Admiralty actually adopted some or any of these methods he advocated is uncertain, but his insistence prepared the way for the acceptance of his great invention that was to follow.

His Ventilators.

In 1740 troops lay embarked off Spithead for an expedition to America. Hales suddenly conceived the notion that large ventilators would be very serviceable in making the air in ships more wholesome. These ventilators were to take the form of large bellows to be worked by hand, which would suck out the foul air from between decks. But he was not alone in this idea. A few months later, Martin Triewald, Captain of Mechanics and Military Architect to the King of Sweden, devised a similar machine, which was fitted on board the men-of-war that were sent to blockade St. Petersburg. As Hales remarked:—

"It were indeed a very extraordinary Circumstance, that two Persons at so great a Distance from each other, without getting a Hint of it, one from the other, should happen to hit on inventing a like very useful engine."

But it was even more remarkable than this, because at the same time, Sutton, a coffee-house keeper in Aldersgate-street, contrived a method of drawing off the bad air on board ship by means of the cook-house fire. Sutton's invention remained in obscurity, but Hales's ventilator at once attracted the attention of the Admiralty.

"Dr. *Lee* having heard of them, he first," writes Hales, "and then the rest of the *Right Honourable the Lords Commissioners of the Admiralty*, were pleased to send for me, to be further informed about them; and thereupon were pleased to order the Master Ship-Wrights, and other officers of *Woolwich* and *Deptford* Yards to consider the most commodious Place where to fix them on a Ship."

Accordingly, they were fitted on board H.M.S. *Captain*, a 70-gun man-of-war. His ventilators, however, were received with "coolness by some, and contempt by others"; it was probably too much trouble to work them. But if they did not find favour at first in the Royal Navy, they met with great success in convict ships and the vessels of the slave trade. The mortality on slave ships was appalling; many are said to have lost up to 50 per cent. of their slaves during voyages across the Atlantic, a death-rate which the installation of ventilators did much to reduce. Five Nova Scotia ships were equipped with them by the Earl of Halifax. Only one slave died in the ventilated ships for every 12 in those unventilated. In a letter to Hales, Captain Thomson wrote as follows:—

"We found this good Effect from Ventilation, that though there were near 200 Men on board, for almost a Year, yet I landed them all well in Georgia notwithstanding they were pressed Men, and delivered me out of Gaols with Distempers upon them. This is what I believe but few Transports, or any other Ships, can brag of; nor did I ever meet the Good-luck before; which, next to Providence, I impute to the Benefit received by Ventilators."

Dr. Demambray wrote:—

"Ventilators were put into the Vessels in the Slave trade, at *Bordeaux*, and in other Ports of *France;* the happy Effect of which was, that instead of the loss of one-fourth of those valuable Cargoes, in long Passages from *Africa* to the *French* plantations, the Loss seldom exceeded a twentieth. And since my Return to *England*, I have been informed of a *French* Vessel, which by this self-evidently reasonable Precaution, saved 308 out of 312 Slaves, spite of most tedious Calms, and a long Passage.'

Thus Hales did much to mitigate some of the horrors of the slave trade, but it is an interesting illustration of the mentality of his generation in respect of social reform, that, when preaching before the trustees of the Colony of Georgia, he confidently justified slavery as being in accordance with the teaching of Christianity!

The Ventilation of Prisons.

Entering the city from the west, the traveller of those days must have been confronted by a curious spectacle. Newgate, the ancient gate of London, built by the executors of the celebrated Richard Whittington, thrice Lord Mayor of London, and only partially destroyed in the Great Fire, had been rebuilt with considerable magnificence.

"It consisted of a carriage archway in the centre; on the side, the footpath was continued through it, which supplied a shelter for two or three old women, who fried small sausages for sale: and in the centre of it was an entry to the chief prison of the city: the mendicant prisoners for debt stood within the iron grated door, vociferating their constant supplication for benefactions to a leathern bag which they drew in as often as it was touched: the upper chambers of the buildings constituted the prisons for felons, for whom a door was opened on the South side adjoining the old wall, and it was from this door that the malefactors were received into the cart for their last journey to Tyburn. Upon the summit was a machine for air, invented by Dr. Hales."

In 1750 a tragedy had occurred during the trial of malefactors at the Sessions House in the Old Bailey. The Lord Mayor, two judges, and a total of 60 persons had died of the gaol distemper, communicated to them by the felons from Newgate! The aldermen of the City of London, naturally seriously alarmed, consulted Hales, and decided to instal ventilators in Newgate to be worked by a windmill erected on the "leads." During the construction of the ventilator the youngest of the journeymen on the work was forced to go down into the main shaft of the ventilator by his fellows to bring up a wig one of them had thrown down. As the windmill was working at the time, he nearly "died of the Stink" it is said, before they could get him up. That night this young man contracted typhus, and seven out of Mr. Stibbs's eleven workmen were striken with the same disease. When at last the system was complete Hales made a tour of inspection of Newgate, and rejoiced to see the ventilators, "drawing like large heavy lungs at the rate of seven thousand tuns of foul air per hour out of the different wards of the prison."

The ancient Savoy Palace, which stood in the Strand, is described in the early part of the eighteenth century as follows :—

"This *Savoy* House is a very great and, at this present, a very ruinous Building. Its large Hall is now divided into several Apartments. A Cooper hath a Part of it for stowing of his Hoops. Other Parts of it serve for two Marshalseas for keeping Prisoners, as Deserters, men prest for military Service, *Dutch* recruits, &c. In this *Savoy*, how ruinous soever it is, are divers good Houses."

These "good houses" comprised the Royal printing press, a parish church, meeting places for a number of religious sects, a prison, and "harbours for many refugees and poor people." The Savoy prison had an evil reputation for the gaol distemper. Regiments on service were terrified of receiving drafts of pressed men thence, lest they brought the typhus with them. So in 1749 the following item of news appeared in an issue of the *Gentleman's Magazine:* "The good Doctor, by desire of the secretary at war, was this day at the Savoy prison, to direct a proper place for the erection of a large ventilator."

Hales's ventilators were also installed in the gaols at Northampton, Shrewsbury, Winchester, Maidstone, Bedford, and Aylesbury; in the London small-pox hospitals, and at St. George's; also in hospitals at Durham, Winchester, and Bristol, and even at Naples! Later they were introduced into the naval and military hospitals and prisons at Gosport, Portsmouth, and Plymouth. So eventually even the Navy was convinced.

"God be thanked," writes Hales, "they are now come into general esteem for the apparent salutary good effect of them in our fleets, hospitals, &c. In the beginning of the year 1756, the Lords Commissioners of the Admiralty ordered them to be put on board the *Royal George*, our largest ship: in which the honourable Admiral Boscawen, taking care to have them properly worked, they were found to have the desired good effect, so to refresh the whole air in the ship, as to preserve in good health 850 men: which happy event occasioned their being ordered to be put into the whole fleet."

Wherever Hales's ventilators were installed the air in the wards is said to have been rendered much purer, and the mortality among the inmates from the gaol distemper considerably reduced. But typhus is due to the bites of infected lice, and not to foul air as Hales supposed. No amount of ventilation, however perfect, could have abolished the gaol distemper. Hales's bellows ventilator has gone. Hospitals and prisons are so built in these days that mechanical ventilation is seldom necessary. But his principle of the forcible propulsion of air still persists, and adequate ventilation remains one of the first principles of preventive medicine. Hales must therefore stand for all time, not only a great biologist, but one of the pioneers in public health.

Hales also suggested that his ventilators should be applied to a number of other practical purposes, and particularly to the preservation of corn dry in granaries, and therefore free from being eaten by insects. At his instigation, Duhamel erected a large windmill ventilator over a public granary in Paris, which is said to have served its purpose very successfully. Hales also recommended their use for drying gunpowder, purifying "stinking water," and ventilating mine shafts. He even adapted them for domestic use. Thus to the Rev. Dr. Kerrich, Dr. Pyle, Chaplain to George II., wrote as follows :—

"Dear Sir, — The only articles, of that sort, that I know of, are: That Dr. Hales hath actually published; what has been sometime talked of; a tube of tin, with a box, of the same, at the lower end of it (like a box for a great seal), that is full of very small holes. This engine, with the help of a pair of bellows, blows up cream into syllabub, with great expedition. This complex machine hath already procured the Dr. the blessing of the housekeeper of this Palace, and of all such as she is, in the present generation (who know the time and labour required to whip this sort of geer): and will cause his name to be had in reverence, by all housekeepers, in the generations that are yet for to come."

The windmill ventilator erected by Hales on Newgate by order of the Aldermen of the City of London in 1752.

(*From a print in the British Museum.*)

His reputation as a scientist was now international. His books had been translated into all the chief European languages. In 1753 he was elected one of the eight foreign members of the Royal Academy of Sciences in Paris. Three years later war was declared with France. England was unprepared, but the French were quick in their attack. "A despondency without parallel in our history," wrote Green the historian, "took possession of our coolest statesmen, and even the impassive Chesterfield cried in despair, '*We are no longer a nation.*'" Throughout these depressing years Hales laboured unceasingly to get Louis XV. to order the installation of ventilators into the French hospitals and prisons where British soldiers were confined. Exerting all his influence through Duhamel and the Duc de Noailles, he was at last successful, and his ventilators were installed into some, at least, of the French gaols, with, it is said, considerable reduction in the death-rate among the British prisoners. On this occasion the Minister of Teddington was heard to say that he hoped no one would inform against him for corresponding with the enemy!

His Last Experiment.

In the year that the war began Hales performed his last experiment. He placed an equal number of gudgeon in two pails of pond-water; the water in one was ventilated with air, the water in the other allowed to remain stagnant. The fish in the former remained well, but those in the latter, the unventilated water, soon "turned sick, came up for air and showed uneasiness, turned belly upwards, and then died." He commented on this experiment as follows:—

"Hence we see the Benefit of frequently replenishing the Water with fresh Air, which we find is necessary not only to preserve the Life of Land Animals, but also of Fish; as also the Use of their Gills, to spread in thin Sheets fresh Supplies of Water, that they may the better come at the air in the water; for which Purpose both Sides of their Gills are furrowed with many fine Furrows, thereby to enlarge their Surfaces.

So at the age of 79 he returns from his applied science to his comparative physiology again, and after the lapse of 40 years completes his long series of experiments on respiration.

"We have good reason," he writes, "to be diligent in making farther and farther researches; for tho' we can never hope to come to the bottom and first principles of things, yet in so inexhaustible a subject, where every smallest part of this wonderful fabrick is wrought in the most curious and beautiful manner, we need not doubt of having our inquiries rewarded with some further pleasing discovery; but if this should not be the reward of our diligence, we are however sure of entertaining our minds after the most agreeable manner, by seeing in everything, with surprising delight, such plain signatures of the wonderful hand of the divine Architect, as must necessarily dispose and carry our thoughts to an act of adoration, the best and noblest employment and entertainment of the mind."

His Life's Work.

Hales was now over 80. He had advanced science by fundamental experiments on the circulation of the blood, the flow of sap, the chemistry of respiration, and the growth of bone. By his work on ventilation he had established one of the first principles of preventive medicine. He had ministered faithfully to his parish for over 50 years. In the last scene of his active life, we see him triumphant, reducing the mortality among British prisoners exiled in the gaols of France! Thus did Hales serve science and humanity, his King and his Country—service immortalised by Alexander Pope:—

> From Peer or Bishop 'tis no easy thing
> To draw the Man who loves his God, or King:
> Alas! I copy (or my draught would fail)
> From honest Mah'met,* or plain Parson Hale.

"Hales delighted to promote the honour of his God by advancing the best welfare of mankind," writes Butler. "In this employment, blessed with serenity of temper, he calmly met his death as an acquaintance long familiarised to this mind." Stephen Hales died at Teddington on Jan. 4th, 1761, in the eighty-fourth year of his age. His monument stands in Westminster Abbey, but his body lies buried, according to his own wish, under the tower which he had built himself, for the church he had loved so well. The inscription on the stones of the floor of the tower records the simple facts of his life and death, but there is no epitaph written on his grave. To-day, however, 250 years after the birth of this great son of this College, let us adapt the words John Wesley wrote of him: "How well did Science and Religion agree in this man of sound understanding!"

* Mah'met, a Turkish servant to the King, whom he took at the siege of Buda, and constantly kept about his person.

QUEEN MARY'S HOSPITAL FOR THE EAST END. The Lord Mayor of London last week laid the foundation-stone of a new wing which will be a memorial to the late Dr. P. J. S. Nicoll, who for many years was chairman of the honorary staff and vice-chairman of the hospital. The extensions will provide 32 additional beds, 24 of which are intended for adult casualties, a new ward for children, and a solarium for which Dr. Nicoll had raised a large sum before his death.

DEATH CERTIFICATION.

THE NEW FORM OF MEDICAL CERTIFICATE.

WITH the coming into force of the Births and Deaths Registration Act (1926) on July 1st next a new form of medical certificate is being issued for the use of registered practitioners. The new form of certificate has been drawn up after consultation between the Registrar-General and representatives of leading bodies in the medical profession with the object of making the official records of the causes of death a more exact summary of the opinions expressed in the certificate than hitherto. The essential part of the certificate is reproduced on the opposite page. On the left of this certificate form is a counterfoil for use of the medical attendant; on the right is the notice to informant that a medical certificate of the cause of death has been signed. The book in which these certificates are bound contains notes and suggestions to certifying medical practitioners.

The Certifier.

No medical certificate of cause of death may be given on the prescribed form unless the certifying medical practitioner has been in attendance upon the deceased during his or her last illness. The certificate must be given and signed by the practitioner who has been attending the deceased during the last illness; and no other person or practitioner may sign the certificate on his behalf. A registered medical practitioner who was in attendance upon a deceased person during his or her last illness is required to give a medical certificate of cause of death on the prescribed form in every case.

The Cause of Death,

The cause of death as certified by the practitioner in attendance during the last illness is entered by the registrar in the death register and forms part of that record. The entry in the death register and the certificate of cause of death itself are also utilised as material for the mortality statistics published by the Registrar-General. The value of these statistics will be materially enhanced if certifying medical practitioners will: (*a*) read and adopt, so far as possible, the suggestions printed below, and (*b*) write the names of diseases (*in full*) in the certificates as legibly as possible, to avoid the risk of their being incorrectly transcribed into the death register. In view of the importance for many public purposes of the mortality statistics based upon these certificates, the Registrar-General hopes that he may rely upon the coöperation of the medical profession in these matters.

Use of Precise Terms.

It is desirable that medical practitioners should employ as far as possible only those terms recognised in the Nomenclature of the Royal College of Physicians of London. The use of vague and ill-defined terms is particularly to be avoided. An alphabetical list of such terms is appended,[1] with comments indicating in what respect the term is unsatisfactory and what further information as to the cause of death is required in each case. A few unobjectionable terms are included in the list for special reasons. This list is intended for reference only, and it is hoped that it will be consulted by certifying practitioners in any case in which they are not assured that the term used by them is included in the nomenclature of the Royal College of Physicians.

In cases where an indefinite term has to be employed because more definite information is lacking it would be well to indicate this fact in the certificate. The word "idiopathic" will be understood as indicating that the probable cause of the condition stated is unknown—e.g., idiopathic atrophy, idiopathic convulsions, idiopathic peritonitis, &c.

[1] An extract of this list was given in THE LANCET of Feb. 12th, p. 359.

Registrar to enter No. of Death Entry. .....

BIRTHS AND DEATHS REGISTRATION ACTS, 1836 TO 1926.

MEDICAL CERTIFICATE OF CAUSE OF DEATH

For use only by a Registered Medical Practitioner who has been in attendance during the deceased's last illness, and to be delivered by him to the Registrar of Births and Deaths direct.

Name of Deceased.....

Date of Death as stated to me.....day of.....19..... Age as stated to me.....

Place of Death.....

Last seen alive by me .....day of .....19..... Seen* / Not seen* after death by me.

Post mortem held* / not held*

CAUSE OF DEATH

I. Immediate cause† .. .. .. a.....

Morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause) .. .. b.....
c.....

II. Other morbid conditions (if important) contributing to death but not related to immediate cause .. ..
.....

I hereby certify that I was in medical attendance during the above named Deceased's last illness, and that the particulars and cause of death above written are true to the best of my knowledge and belief.

Signature..... *Qualifications as registered by Medical Council* .....

Residence..... *Date*.....

* Strike out whichever is inapplicable.

† This means the disease, injury, or complication which caused death—**not** the mode of dying, as, e.g., heart failure, asphyxia, asthenia, &c.

Immediate and Remote Causes.

In a majority of cases only one cause of death need be stated and in these the form of the certificate is of little importance. But where two or more causes are entered the distinction between "primary" and "secondary" is no longer called for, as it was found to give rise to confusion. The present form of certificate is divided into two sections (I. and II.). In "I." should be entered the immediate cause of death and any morbid conditions which led up to it, the latter being stated in order backwards from the immediate to the remoter causes. In "II." should be entered conditions which are not in the chain of pathological events which have led to the immediate cause of death but which have none the less contributed seriously to the fatal issue. The seven examples here given are intended to make these points clear.

When possible it should be stated in the certificate whether the condition was acute or chronic. It is suggested that the practitioner should in each case first consider whether the essential features of the case cannot be epitomised by statement of a single cause—e.g., pulmonary tuberculosis—and that where entry of more than one cause is required he should next consider whether the conditions specified were or were not of independent origin, and indicate this by entry in the appropriate space. If either this distinction or that implied by order of entry under "I." cannot be made the fact should be stated.

Seven Examples of Method of Using the New Form of Certificate.

	Ex. 1.	*Ex. 2.*	*Ex. 3.*	*Ex. 4.*	*Ex. 5.*	*Ex. 6.*	*Ex. 7.*
I. Immediate Cause	I. (*a*) Lobar pneumonia	I. (*a*) Puerperal eclampsia	I. (*a*) Carcinoma of liver	I. (*a*) Hæmatemesis	I. (*a*) Acute peritonitis	I. (*a*) Pyelonephritis	I. (*a*) Bronchopneumonia
Morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause).	(*b*) —	(*b*) —	(*b*) Carcinoma of rectum (excised)	(*b*) Chronic gastric ulcer	(*b*) Intestinal perforation	(*b*) Myelitis	(*b*) Operation
	(*c*) —	(*c*) —	(*c*) —	(*c*) —	(*c*) Enteric fever	(*c*) Syphilis	(*c*) Strangulated inguinal hernia
II. Other morbid conditions (if important) contributing to death but not related to immediate cause.	II. —	II. —	II. —	II. —	II. —	II. —	II. Chronic interstitial nephritis

Special Causes of Death.

Some points arise in regard to special causes of death:—

(*a*) *Cancer.*—Attention is particularly directed

to the request that the seat of primary occurrence should be returned in all cases where known.

(*b*) *Childbirth.*—Whenever parturition or pregnancy has been in any way a contributory cause of death, the fact should be mentioned on the certificate. All diseases arising therefrom should be described as puerperal—e.g., puerperal eclampsia, puerperal septicæmia, distinguishing in the latter case between septicæmia originating in abortion and in childbirth.

(*c*) *Violence.*—The following suggestions as to the form of certification of deaths from violence, which for this purpose includes all deaths from unnatural causes (including anæsthetics and poisons of all forms), whether accidental, suicidal, or homicidal, are extracted from the Registrar-General's Circular to His Majesty's Coroners (1911):—

"In every case of death by violence or by suspected violence, whether the death resulted from the violence itself or from a pathological state induced by it, the verdict should state the form and means of violence, its accidental, suicidal, or homicidal nature, and the nature of the injury—e.g. fracture of skull (*nature of injury*) due to being *accidentally* run over (*form of violence*) by a motor-car (*means of violence*)."

(*d*) *Anæsthetics.*—When death occurs during anæsthesia, or is in any degree attributable thereto, the nature of the anæsthetic used should be recorded.

Reporting to the Coroner.

On the back of the certificate form is provision for two additional statements, to be filled up by the doctor in any case where they apply. The first relates to informing the coroner. The law as stated in Jervis on Coroners provides that:—

"In all cases of sudden death or death under any circumstances of suspicion where the duty of informing the Coroner is not by Statute imposed upon any particular person, it is the duty of those who are about the deceased to give immediate notice to the Coroner or his officer or to the nearest officer of police, who then communicates with the Coroner."

Where a practitioner who was in attendance during the deceased's last illness gives notice in accordance with the obligation above described he should, on giving the certificate of cause of death, initial the Statement A on the back of the certificate.

Obligation to Give a Certificate.

Some doubts have existed as to the duty of practitioners to give certificates of cause of death in a case where an inquest may possibly take place. It is desired to point out that, as the law now stands, the duty placed upon a registered medical practitioner who was in attendance upon a deceased person in his or her last illness to give a medical certificate of the cause of death to the best of his knowledge and belief, appears to be unqualified, and unaffected by the fact that he or some other person has reported the case to the coroner or that an inquest may take place.

The practice of refraining from giving a medical certificate of cause of death when the case is being reported to the coroner was to some extent strengthened by the fear that, if a medical certificate is given, the death may forthwith be registered and the body buried before an inquest can take place. Statement A on the back of the certificate has accordingly been included to obviate any such risk. If the practitioner when giving a certificate is also reporting the case to the coroner and accordingly initials Statement A on the back of the certificate, it will be the duty of the registrar to suspend the registration of the death until he learns from the coroner whether an inquest is or is not to be held.

Additional Information.

Cases are understood to occur where the practitioner, when certifying the cause of death, is aware that some post-mortem or laboratory examination is about to take place or is in progress, from the results of which some further information may become available which will be of value for statistical purposes. Provision is accordingly made in Statement B on the back of the certificate whereby the practitioner may give an indication that he may be in a position, if applied to later by the Registrar-General, to furnish additional information for statistical purposes. On the receipt by the Registrar-General of a certificate on which the practitioner has initialled Statement B, the Registrar-General will in due course address an inquiry to the practitioner, in order that the latter may communicate any further information with respect to the death which he may then be able and willing to give.

Medical Officers of Institutions.

In certain cases deceased persons whose death took place in an institution are certified on the medical certificate of cause of death as "not seen after death" for the reason that, although such persons may in fact have been seen after death by *some* medical officer of the institution, they were not seen after death by the medical officer by whom the certificate was actually signed. The latter is recommended to cross out the words "not seen" and "me" in the statement—

"Seen / Not seen } after death by me"

and write underneath those printed words the name of the medical officer by whom the deceased was seen after death. The certificate will then read—"Seen after death by Dr. So and So."

ROYAL INSTITUTE OF PUBLIC HEALTH.
THE CONGRESS AT GHENT.

THE annual Congress of the Institute was held at Ghent, Belgium, from June 1st to 6th under the presidency of Viscount BURNHAM. The King and Queen of the Belgians were present at the inaugural meeting.

Honorary degrees were conferred by the University of Ghent upon Sir Berkeley Moynihan (President of the Royal College of Surgeons of England), Lord Burnham, and Sir William Smith (senior Vice-President and Principal of the Institute).

PROBLEMS OF PUBLIC HEALTH.

The subjects considered by the Section of State Medicine covered a large field.

Dr. MARY SHARE-JONES (A.M.O.H., Denbighshire) discussed how far State interference in personal matters was justifiable. She had found that the objection to vaccination was not intelligent but a mere stubborn display of freewill; legislation on vaccination was more forceful in other countries. Notification of tuberculosis was very lax in some areas. As regards housing to-day, there was a widespread demand for the withdrawal of State interference, but a compromise between this and private enterprise was wanted. The absence of provision for compensation was a weakness in the Meat Regulations, and invited certain owners of animals to conceal disease.

Dr. W. A. MURPHY (M.O.H., Ogmore and Garw U.D.C.) dealt with the sanitary problems of a colliery district. The mining valleys in South Wales, he said, were so narrow that hillsides had to be excavated for housing sites, which added £50 to £100 to the cost of each house. River pollution, due to the coal washings and the actual mine refuse falling into the rivers, was general. Subsidence due to undermining broke the continuity of all pipes and caused the windows to jam. The best type of owner felt discouraged because he was compelled to rebuild the house at the expiry of the lease. Compensation should be payable. The local sanitary authorities had no control over the sanitation of the mines; below ground the miners used the gobs or wastes for depositing dejecta, and probably the drinking of mine water accounted for sporadic cases of typhoid fever. The death-rate from bronchitis in mining areas was much higher among males than females; this was probably due to chilling brought about by

the soaking of the clothes with sweat during work and the change from the warmer mine to the colder surface above; pithead baths should do much to remedy both this and the excessive work given the housewife by the men bringing dirt into their homes and requiring hot baths. Colliery stacks gave off much black smoke, especially where there were draught furnaces; no improvement was likely to result from the Smoke Abatement Act, 1926.

Dr. G. Q. LENNANE (M.O.H., Battersea), dealing with the hygiene of flueless gas stoves, pointed out that their ventilating effect was nil; further legislation was required prohibiting their use in dwelling rooms.

Diphtheria Carriers.

Dr. J. E. MCCARTNEY (Director of Research, Metropolitan Asylums Board) spoke on diphtheria carriers. He and Dr. W. C. Harvey took as their criterion the presence of virulent diphtheria bacilli 12 weeks after the onset of the disease. Before a case was discharged six consecutive negative swabs should be taken over a period of three weeks. Among 1000 patients they had found 8·7 per cent. of carriers; in another series of 1080, 8·2 per cent. Organisms disappeared more rapidly from the throat than from the nose. The age of the patient was important; carriers were more common in the first seven years of life. Intermittent carriers were found. By far the most of the carriers had recovered from their illness, and only 18 per cent. showed any general debility. If anything, severe cases were less liable to become carriers than others. The carrier condition was due to failure of the normal process of getting rid of the bacilli; there was no evidence of difference of the bacterial flora in carriers and others, nor of an alteration in the biological character of the diphtheria bacilli. The nasal element was very important: most of the nasal carriers were under 5 years of age, and had suffered from purulent rhinitis; in only eight out of 185 cases was a pathological lesion absent. When rhinorrhœa disappeared the bacilli disappeared too, returning when the rhinorrhœa came back. The antibody content in the blood of carriers was high; evidently the bacilli lived outside the human body on inflammatory products. As regards treatment, when the bacilli were limited to the throat tonsillectomy brought about cure in 100 per cent. of cases; the intricacy of the nasal passages in young children made it difficult to reach them from without, and they must be treated by autogenous vaccines made from the organism causing the inflammation, usually the pneumococcus or hæmolytic streptococcus. Nasal douching was useful both to prevent and to remedy the condition.

School Medicine.

An interesting discussion on school medicine resulted from the papers of Dr. DUNSTAN BREWER (M.O.H., Swindon), Dr. J. F. BLACKETT (M.O.H., Bath), and Dr. CHARBONNIER (St. Josse ten Noode).

Dr. BREWER pointed out that the aim of school medicine was not to patch up things which had gone wrong; what was needed was the physiological measurement of the phenomena of child life. Dr. BLACKETT said that, unfortunately, the criterion in school medicine to-day was the child's ability to take advantage of the education offered it and not his health. The work should be primarily preventive. Might it not be better to build a house to replace a slum dwelling rather than maintain four beds at a sanatorium? Although school doctors perhaps could not do research with a big "R," he thought that they were quite capable of coöperative research with clinicians, medical statisticians, and pathologists.—Dr. CHARBONNIER, with other speakers, held that the school doctor should be a man of considerable experience. There were many difficulties in school medicine, and it was absurd that such work should be undertaken by the comparatively recently qualified.—Dr. G. F. BUCHAN (M.O.H., Willesden) remarked that while it was easy to diagnose a case of lobar pneumonia, it was extremely difficult to diagnose the conditions which had led up to a state of malnutrition.—Dr. P. LOMRY (Belgian Ministry of Health) thought that the forcing of the intellects of young children was responsible for much ill-health and even fatal disease.

Health Propaganda.

The merits of public health propaganda gave rise to a lively discussion. Dr. L. DELATTRE (Belgian Ministry of Health) considered that even the most humble classes of the community could be reached by instruction. The public authorities could thus enable the people to avoid or reduce many illnesses, and interest would be aroused in the public health institutions. The most valuable means of instruction were the Red Cross, the elementary school, and the trained nurse.—Dr. K. E. TAPPER (M.O.H., Bromley) said that in certain forms of health publicity half-truths were being exploited which to-morrow might prove fallacies; this called for a control of all health publicity. The propaganda of so many societies was only leading to chaos in the public mind.—Dr. C. S. THOMSON (M.O.H., Deptford) held that it was the duty of those in charge of the public health to teach the people.—Dr. J. R KAYE (M.O.H., West Riding) said that very successful health crossword puzzles had been used in his schools. Other speakers were doubtful whether the general population gathered very much from health lectures and addresses.

Milk, Water, and Meat Supplies.

Mr. WILFRED BUCKLEY (Chairman, Clean Milk Society) asked for half-yearly inspection of cattle by whole-time veterinary inspectors in order to eliminate tuberculous milk. He held that persons adulterating milk and defaulting wholesalers should be legally debarred from selling milk. All milk sold should be classified in a way understandable by the purchasers, the price varying according to the quality.—Dr. KAYE was very much opposed to pasteurisation, and this measure was objected to by others as militating against the adoption of cleanly methods.

Dr. J. J. PATERSON (M.O.H., East Berks U.S.D.), referring to the many town workers who slept in the country, said that they required much more water than the ordinary rural population. The legal powers of a rural sanitary authority were at present inadequate. The area of supply of a water company was limited by purely artificial boundaries fixed long before housing schemes were dreamt of, and the company was under no obligation to supply water to a house or group of houses unless it "payed." Local territorial water boards were wanted.—Mr. L. GILLET and Mr. C. GUILLAUME spoke on the value of determining the chlorides in connexion with the potability of water; the presence of more than an easily ascertained quantity was a safe index of poutillon.

Prof. J. T. SHARE-JONES (Director of Veterinary Studies, Liverpool University), speaking on animal industry and public health, said that eventually the U.S.A. would compete with Great Britain for the meat products of the Argentine. He asked for a State-aided system of live stock insurance, in order that investors might be disposed to put more money into the industry in this country. Out of such an insurance would grow measures for the prevention of disease among cattle.

Dr. E. SACQUÉPÉE (Medical Inspector, French Army) pointed out the value of a continuous medical supervision of army cooks during epidemics, especially of intestinal diseases.—Dr. DEQUIDT (Inspector-General of Hygiene, France) and Prof. ROCHAIX (Lyons) went into the administrative arrangements in various countries for dealing with "carriers."

INDUSTRIAL HYGIENE.

In a presidential address to the Section of Industrial Hygiene, Viscount LEVERHULME said that at Port Sunlight accidents were less frequent during periods of greatest employment; probably when employment was good the individual worked with greater

deliberation. On Mondays and Tuesdays the highest number of accidents occurred; then came Fridays; less occurred on Wednesdays and Thursdays. The largest percentage of accidents were found amongst workers over 40 years of age, possibly because familiarity bred contempt. Music had been introduced into departments where monotonous work, such as stamping, wrapping, and packeting of goods was carried on. Factory girls, unfortunately, had no opportunity of learning housekeeping and the care of children before marriage, and employers would be doing a national service by supplying them with facilities.

Cancer.

A discussion on industrial cancer was opened by Dr. A. LEITCH (Director of the Cancer Hospital Research Institute, London) and Dr. R. PROSSER WHITE (Wigan). Dr. LEITCH pointed out that persons exposed to influences conducive to cancer might develop the disease long after leaving their occupation. He thought that Kashmir cancer was due to the influence of heat alone; all its victims showed multiple cicatrices, and there was no evidence of any influence of charcoal fumes. Cancers due to single traumata occurred, but were rare. He referred to a case of epithelioma of the skin inside the nostril, which had started 16 days after splashing with a spot of tar; many experiments had been made by dropping hot tar once on the back of mice, but it was very unusual for cancer to develop. The tendency in Belgium to produce low temperature tars should help towards prevention of tar cancer; the lower the temperature at which tars and mineral oils were distilled the less was the tendency to produce cancer. It was only when the tar from splint coal used in Scotland was distilled at high temperatures that it caused cancer. He did not believe in an inherent disposition of an individual to contract the disease. Nor was he convinced that oil need be locally applied to produce cancer of the scrotum; this part of the body was so sensitive that all that was necessary was for a minute portion of oil to reach the scrotum somehow. In chimney-sweeps' cancer only an infinitesimal portion of soot reached the scrotum; again, only a small portion of this soot was soluble in sebaceous material, and it took years and years of this effect to produce the cancer. Dr. Leitch referred to the absence of mule-spinners' cancer when sperm oil was used; this oil was expensive, and efforts were being made to elaborate a suitable harmless vegetable oil which would be more widely used.

Temperature and Humidity.

Mr. S. WYATT, who is working for the Medical Research Council, gave instances of the deleterious effect of high temperature combined with humidity on the efficiency of workers. Among tin-plate workers the output was 13·4 per cent. less in the hottest month of the year than in the coldest month. In the coal mining industry the most favourable temperatures and humidity for work occurred when the dry bulb registered 73·5° F. and the wet bulb 66° F.; only 59 per cent. of this output was produced when the dry bulb registered 86·2° F. and the wet bulb 79° F. Industrial accidents were more frequent at high temperatures, the optimum being about 67° F.; at 77° F. the frequency was 23 per cent., and at 57° F. 16 per cent. greater. Vernon and Bedford, examining the absences on account of sickness among women employed in six different departments of a factory, found that in one department, where the temperature was comparatively low, the loss of time during absence was greater in the winter months than in the other departments; a similar phenomenon occurred in the summer. Increased air movement by means of fans would do much to produce cooling in factories. It had been shown that if the cooling power of the naked skin were taken as 100, it was reduced to 73 by the wearing of a woollen vest, the addition of a linen shirt brought it down to 60, whilst the wearing of a coat as well further reduced the cooling power to 46. Many industrial workers were overclad; they should have the arms, neck, and as much as possible of the chest and body bare; the garment should be loose and of loose texture.

A paper by Prof. C. P. VAGLOU (Harvard) dealt with experiments with two conditioning rooms in which the warmth, humidity, and air movements could be varied. Many thousand trials had been made by factory employees wearing their working clothes; first they entered one room, and then the other, where the conditions had been adjusted to vary slightly, and then they were asked which they preferred. From the results of these observations an "effective" temperature chart had been prepared. The sensations of one temperature could be obtained at another temperature by adjusting the humidity and the air movement. The comfort zone was at a much higher temperature when the workers were partly stripped.—Prof. E. L. COLLIS thought that although, for scientific purposes, the "effective" temperature chart would be valuable, in actual practice the kata-thermometer would still be widely used because of the difficulty of determining air movements at low velocities by anemometers; indeed, the kata-thermometer was the best anemometer under these conditions.

Firedamp.

In the course of a discussion on the hygiene of mines Dr. VAN HASSEL DE PATURAGE said that firedamp was not poisonous in itself; it was only dangerous when it replaced the oxygen. It might come out slowly from the coal or erupt suddenly, causing forcible projection of coal dust, rock, and pieces of wood. Mixtures of 6 to 17 per cent. of firedamp with air were explosive. The miners might be injured by the projectiles, they might be burnt when the gas caught fire, and they might be asphyxiated by the carbon monoxide formed. He emphasised the value of subcutaneous injections of oxygen, which should be given by a trained lay personnel, while the men were still down the mine, and described an apparatus he had invented for the purpose.—Dr. ROELS thought that injections of lobeline should be tried.—Prof. COLLIS mentioned the apparatus recently brought out by Prof. J. S. Haldane, much used in America and England, in which the oxygen administered was mixed with 4 to 5 per cent. of carbon dioxide to stimulate the bulbar centres.

NAVAL, MILITARY, AIR, AND TROPICAL DISEASES.

At the section devoted to these subjects a paper on the maintenance of satisfactory air temperatures in living and working spaces in ships in the British Navy was read by Surgeon-Captain T. B. SHAW, and considerable time was given to health problems of the mercantile marine.

Dr. VIGNÉ (Le Havre) pointed out the importance of preventing any tuberculous person entering the mercantile marine; the personnel should be inspected before every voyage by the ship's doctor (or in ships not carrying doctors by the port authorities). Tuberculosis was produced by the conditions of sea life, and there ought to be an insurance scheme so that any seaman discharged on account of tuberculosis should have monetary assistance to enable him to work at some other occupation.

Dr. R. BERNARD (Brussels) and Mr. M. HAECK (Ostend) outlined the arrangements necessary for wireless consultations at sea. While avoiding any attempt at "treatment by correspondence," patients when at sea could be helped by radiotelegraphy. Messages could be sent enormous distances by a system of relays, but first international agreement would have to be reached. A code would not serve, and specially internationalised radiotelegraphic formulas would have to be devised; a special wavelength should be reserved for the purpose.

Lieut.-Colonel C. F. SEARLE showed a model of a portable field latrine which could be used even by

units on the march. Six seats were provided for every 100 men; protection from rain was afforded by impermeable canvas. He pointed out the waste of money entailed by erecting temporary latrines for a fortnight's camp; the use of shallow trenches was very objectionable. Much illness in the army was due to constipation caused by reluctance to use unsatisfactory sanitary accommodation.

Selection of Airmen.

Wing-Commander T. S. RIPPON dealt with methods of examination of airmen which did not require elaborate apparatus. Personality was studied in conversation about the candidate's habits, amusements, likes and dislikes, the questions being founded on a knowledge of the temperament of the successful pilot. Mental tests were then employed. These included the time taken to play a single-handed game of dominoes (a very good time being 50–55 seconds). Visual apprehension was tested by exposing a group of ten familiar objects for six seconds, after which they were enumerated by the candidate; the average result was seven correct. Reflex reaction time could be estimated by visual auditory or tactile signals; these were not found very useful if used alone, but when the candidate was given a choice of two or more signals and instructed to reply to one only, a higher correlation with flying ability was obtained. If a sudden loud noise was added to the test, a satisfactory method of grading pupils under instruction was obtained.

Undulant Fever and Malaria.

Sir PERCY BASSETT-SMITH considered that no relationship between undulant fever and the epidemic abortion of animals had been established. Undulant fever occurred originally on the Mediterranean littoral, from which it had spread inland. A French Government Commission had found that the disease, which formerly affected three provinces only, had now spread to 13; the infection of sheep was almost as great as that of goats. Epidemic abortion, however, had affected cattle and pigs in a very much larger area of France; there were thus epidemiological differences between the two diseases. Although the organisms were somewhat similar, considerable distinction even in morphology could be made between them. The abortus organism was confined to the genital tract; clinically a very massive dose was required to produce disease in man, whereas it was difficult for a laboratory worker to escape infection with the undulant fever organism. It was very rare for any woman with undulant fever to abort.

Dr. A. BRODEN had found plasmochin valuable for malaria patients sent home from the Congo. Patients infested with *Plasmodium vivax* were rapidly cured with plasmochin alone; those with *P. falciparum* and gametes responded equally quickly to treatment with a mixture of plasmochin and quinine.

The other Sections of the Congress were devoted to Pathology, Bacteriology, and Biochemistry, and to Women and the Public Health. A very large number of subjects were considered.

CHINA.

(FROM OUR OWN CORRESPONDENT.)

Shanghai and the Defence Force.

NOT often has the British Army been called upon to face a more difficult situation than now confronts the Defence Force at Shanghai. In combination with Japanese, American, French, Italian, Spanish, and Portuguese units, as well as the International Volunteer Corps, our troops since landing have been guarding a city which is never ttacked and, now that the Chinese have noted its strength, is not likely to be. With this inaction it is no small task to keep the men constantly keyed up to fighting pitch, especially in such surroundings. The boundary is marked by barbed wire fences within which, in an area of 8¾ square miles with a foreign population of 23,100 and 802,700 Chinese—in other words, a density of 149 persons per acre—our 10,000 troops, in addition to those of other nations and a large number of commercial and missionary refugees, have had to find quarters. From this it will be seen why the authorities have been hard put to it to meet the heavy civil and military requirements.

Shanghai is fortunate in the possession of a very efficient municipal health department, at the head of which is Dr. Noel Davis, under whose watchful eye the problems of sanitation and preventive medicine are being constantly studied and dealt with. Since the arrival of the British troops there have been many cases of influenza and pneumonia, but the question of venereal disease has been the most clamant one, and in spite of every possible precaution the number of those affected has steadily increased. The community has risen to the occasion and a great deal of very meritorious work has been done, notably by the British Women's Association, in opening recreation centres. Football, hockey, and cricket fields have been provided and there are various clubs to which soldiers are made welcome. No young soldier need lack for friends and entertainment, but in spite of all this care there are, unfortunately, ample opportunities of infection. Numbers of prostitutes from north and south have flocked to Shanghai, most of them being Chinese (60 per cent.), Russians (30 per cent.), and Japanese (5 per cent.) The majority of the brothels are in the French Concession and in Chinese districts bordering on municipal roads. The high venereal rate has given the Command much concern and no stone is left unturned in the effort to lower it.

The present cool spring is the healthiest time of the year. Soon, however, the hot weather will set in and the authorities will have to face a momentous problem in maintaining the health of the Forces. An important division of the work is that of inoculation and vaccination against the diseases endemic in Shanghai. There is a field hygienic section and a sanitary section under Royal Army Medical Corps public health specialists with N.C.O.'s and men who are trained inspectors and are quick to see where faults need remedy. Intensive health propaganda is going on throughout the Force, in addition to the work of inspecting, advising, and improvising. A careful system of chlorination is carried out in each billet to safeguard the water-supply. Mosquitoes swarm during the summer months and a net will be issued to each soldier; veils are to be worn by men on sentry duty. Flies will also come under ban as far as possible; food is to be kept in fly-proof safes and each unit is being provided with fly sprays for use in billets. Chinese cooks are being carefully supervised and all food given to the Force is inspected by qualified members of the different units. No cook can expect to retain his post unless he submits to examination to show whether he is a disease-carrier or not. Electric fans are being provided and heat-stroke stations are being erected at which the troops can receive first-aid treatment, by application of ice caps, until they can be taken to hospital. There is a health and sports section at Divisional Headquarters following the same lines as those worked out for the Army in India.

It will thus be seen that the authorities are doing their very best for the soldier, who has a difficult psychological part to play in maintaining himself in a state of constant readiness to meet attack. The whole political situation is too chaotic to admit of any intelligent anticipation, but there is every indication that no attempt on the Settlement is contemplated by the Chinese Generals of either side while our troops are here. It may be said of the Shanghai Defence Force that it will not be needed till it has left. Its advent undoubtedly saved the city.

The Military Hospital.

In a comparatively short time a modern office and apartment building has been transformed into a well-equipped and commodious 300-bed military hospital for British troops. Wards for officers and

men, executive offices, operating theatres and adjoining surgical rooms, X ray equipment, laboratories, dispensary, dental clinic, living quarters for R.A.M.C. personnel—all of which are now comprised in the building's eight floors—make it difficult to think of the place as designed for any other purpose. An adjoining corner of land is rapidly being prepared as a recreation ground for patients. Partitions throughout the entire building were knocked down and three- and four-room apartments had their dividing walls removed to make the long wards. X ray work is done by a Solus portable apparatus which is mounted on a trolley, can be moved from one ward to another, and is noiseless when taking pictures. The fourth floor contains wards for acute medical cases, also a special ward for pulmonary isolation cases. The main surgical ward is on the fifth floor, together with the operating theatres. Officer patients are on the sixth floor in smaller wards and the hospital staff is housed on the seventh floor, while the kitchens are on the eighth floor where there are also dining and recreation rooms. The present staff represents only one-third of the actual unit, which is known as No. 7 British General Hospital; two-thirds of the staff and equipment are still at Hong-Kong. Brevet-Colonel E. Ryan, D.S.O., is in command. Another section of 200 beds will shortly be opened in the Polytechnic Public School, and accommodation is being sought for a further 100 beds. When the hot weather arrives and the disease-rate rises another general hospital will be available, as it has already left England. A large number of sick have already been admitted to the Country Hospital, a palatial new building embodying all the advantages of a modern hospital and recently put up by an Englishman who presented it anonymously to the Shanghai community for the use of all nationalities. Arrangements have been made for hospital accommodation in Vancouver for convalescents during the hot weather, but, if for nothing else than the sake of the British ratepayers' purse, it must be hoped that advantage will be taken of coastal health resorts in North China such as Wei-hai-wei, Shan-hai-kuan, and Peitai-ho, the use of which would obviate the long and costly journey to Canada and back.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee 36 cases were considered and £690 voted to 34 applicants. The following is a summary of some of the cases relieved.

L.R.C.P., aged 82, widower, one daughter, aged 33, teacher of piano and violin. Applicant had to give up practising on account of age and deafness. His savings with those of his daughter's were invested in purchasing the house they now live in. They have let three rooms receiving 25s. a week in rent. Apart from this applicant has the Old Age Pension and the daughter receives £20 as an organist. She has no pupils at present. Interest on mortgage £24 per annum. Ground rent £7, rates £20. Voted £10 in 12 monthly instalments.

Daughter, aged 79, of M.R.C.S. who died in 1885. She suffers from rheumatism and has cataract on both eyes. She has two pensions, one of which is the Old Age Pension; these amount to £66 per annum. £5 is received from investments and £65 from letting. Applicant's sister died last month and was an annuitant of this Fund. Voted £20 in 12 monthly instalments.

Daughter, aged 50, of M.R.C.S. who died in 1880. Only employment is rent collecting, from which she receives about £63 per annum. Other income £5 from investments. Rent 7s. 6d. per week. Unable to get additional work on account of ill-health. The Fund helped this case in 1913 to enable the applicant to have typewriting lessons. Voted £26 in 12 monthly instalments.

Son, aged 16, of M.B. Glasg. who died in 1924. Mother is in a mental hospital. The boy is in charge of an uncle who is not able to keep him entirely. He earns 10s. a week as an engineer's apprentice. Fund repeated the grant of £26 towards his maintenance.

Son, aged 3, of L.R.C.P. who died in 1926. This boy, with his two elder brothers and one sister, are entirely dependent on an uncle who is quite unable to meet all the heavy expenses connected with maintenance and education. The boy for whom help is asked is living with his grandmother, who only has the Old Age Pension and augments this by taking a lodger. Fund voted £25 towards maintenance.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

CARE OF MENTAL DEFICIENCY.

THE BOARD OF CONTROL AND THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

The Duties of Local Authorities.

THE want of accommodation for all types of defectives was emphasised in the annual report of the Board of Control for the year 1924, and in the report for 1925 it is stated that the position has become more acute, since the number of new beds has not kept pace with the number of new cases, and nothing has been done to overtake the arrears. The Board of Control has invited local authorities to submit schemes, but the response has been poor, and the failure of local authorities to fulfil their duties is held to be hampering the beneficent objects of the Mental Deficiency Act, which was designed to give care, training, and protection to the most helpless class in the community. The total number of mental defectives ascertained up to the end of 1925 was 55,480, an increase of 6702 over the previous year. There is strong evidence that a large number of defectives have not yet been ascertained, some of the local authorities making insufficient use of the local branches of the Central Association for Mental Welfare in this connexion. Concerning 2338 of the cases reported by the local education authority in 1925 no action had been taken at the time of the issue of the last annual report of the Board of Control, and there were also 2141 cases otherwise ascertained for whom no form of care had yet been forthcoming. 1205 cases were "waiting removal" to an institution, being over 500 more cases than in the previous year. Only 17 local authorities have made institutional provision under Section 30 (*c*) of the Mental Deficiency Act, 7 others have acquired estates on which to establish colonies, and 18 are at least giving serious consideration to the problem.

This brief summary of the relevant section of the annual report of the Board of Control, on which we have already commented (THE LANCET, 1926, ii., 652), serves to show the magnitude of the problem and the need for examining every possible factor which may help local authorities to ascertain, classify, and place under supervision, guardianship, or institutional care the mental defectives in their districts. The various methods for dealing with mental defectives in this country are clearly summarised by Sir Robert Armstrong-Jones elsewhere in this issue of THE LANCET; it is evident that even were it possible to find suitable accommodation, guardians, or homes for every afflicted person, the problem of classification would not be an easy one. But it is made more complex by the severe lack of institutional accommodation, which reacts on the selection by local authorities of cases suitable for statutory supervision or guardianship. The Board of Control have reason to believe that many local authorities have no guiding principle in the selection of suitable cases for supervision, and that large numbers are placed under supervision simply because there are no vacancies for them in institutions. As to guardianship, though the number of cases thus dealt with was 601 on Jan. 1st, 1926 (an increase of 111 on the numbers of the previous year), 54 local authorities out of a total of 124 have not a single case under guardianship, while 29 others have only one or at the most two cases.

Proposal to Appoint "Medical Officers of Mental Health."

Among the constructive suggestions made by the Board of Control is that of the appointment of whole- or part-time medical officers with special training in the subject of mental deficiency to assist local committees in carrying out their work for the care, training, and protection of defectives. At the present time three local authorities have appointed whole-time medical officers. In four cases general practitioners have been appointed as part-time officers,

and two of these have had mental hospital or special school experience. In two other instances consultants have been appointed. The general practice, however, has been to place the medical work under the direction of the medical officer of health. Of the 333 medical officers to whom duties under the Mental Deficiency Act have been allocated by the local authorities, only 108 have had special training or experience in mental deficiency work. The Board of Control expresses the opinion that it is generally desirable that the medical officers actually doing the work should be in direct touch with the Statutory Committee for Mental Deficiency. In their opinion efficiency is not likely to be secured if the subject is in the hands of a number of medical officers "without special training and chiefly interested in other public service," and they look forward to the time when each district will have a medical officer whose principal work is mental deficiency, and who should be the expert adviser of the committee. The Board, in fact, go even further when they express conviction that "a measure which brought all mental patients under one authority, both locally and centrally, would be beneficial and would render a consistent and scientific treatment of the whole question possible. It would then . . . be essential that each county or county borough council should establish the post of medical officer of mental health."

Rejoinder of the Society of Medical Officers of Health:

It is hardly surprising that these suggestions have not been allowed to pass unchallenged. A memorandum issued by the Society of Medical Officers of Health and appearing in the June issue of *Public Health*, protests against statements in the annual report of the Board of Control which they consider to be calculated to induce local authorities to isolate mental deficiency work from the general work of public health. They deprecate any suggestion that mental deficiency work should be carried out under the control of a medical officer who is not attached to the Public Health Department. They point out that no proof is offered (or in their opinion exists) that those authorities which have employed whole-time medical officers exclusively for mental deficiency work have obtained better results than those who have entrusted the duties connected with this work to medical officers who combine it with other duties. The Society give reasons for believing that "the chief medical adviser to the Mental Deficiency Act Committee should be the medical officer of health in whose department and under whose administrative supervision the whole of the work of mental deficiency undertaken by the county local authority should be carried out. Any separation of the mental deficiency work from the Health Department must inevitably lead to increased cost and decreased efficiency. By combining various duties in one officer a substantial economy in working expenses is obtained and at the same time by allocating given proportions of time to the various duties there is no danger of any particular duty being neglected."

Such differences of opinion as to methods of dealing with the medical supervision of mental defectives at any rate point to a revival of interest in a rather depressing branch of sociology which has been unduly neglected.

THE issue of *Nature* for June 18th will include a special supplement devoted to articles on various aspects of solar eclipses, of interest not only to observers but also to general readers. The publishers are Macmillan and Co., St. Martin's-street, London, W.C. 2, and the price is 1*s*.

WE regret to announce the death on June 8th, at a nursing home in Greenford, of Mr. George Bethell, late Registrar of the Medical Society of London, and secretary of the Royal Medical Benevolent Fund. In both these capacities Mr. Bethell's work brought him into close contact with a large circle of medical men who were able to rely implicitly on his ability and devotion to duty. He was in his fifty-eighth year.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. R. H. Atkins is placed on Retd. List with rank of Surg. Capt.

C. T. Hyatt, J. L. Malone, and T. F. Barlow to be Surg. Lts.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. and Bt. Col. F. S. Irvine from R.A.M.C., to be Col., vice Col. H. Herrick to retd. pay.

Maj. F. J. Garland to be Lt.-Col., vice Lt.-Col. and Bt.-Col. F. S. Irvine, promoted.

Capt. E. S. Cuthbert to be Maj. (Prov.).

Maj. A. E. G. Fraser, half-pay list, late R.A.M.C., on completion of a period of five years on the half-pay list, is placed on retd. pay on account of ill-health.

Maj. J. Vallance, Reg. Army Res. of Off., to be Capt. whilst re-empld. under Art. 507 (b), Royal Warrant for Pay and Promotion, 1926, and relinquishes the rank of Maj.

Capts. be to Majs.: L. B. Clarke and W. McE. Snodgrass.

Capt. A. Mearns to be Maj. (Prov.).

To be Temp. Lts.: I. MacW. Bourke, B. H. H. Tripp, G. de N. U. Somers, and J. B. Carrigan.

TERRITORIAL ARMY.

Lt. T. Wallace, late R.A.M.C., to be Lt.

A. T. Ashcroft, D. S. Middleton, and H. MacG. Coope to be Lts.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Cols. E. B. Bird, W. Archibald, A. A. W. Merrick, A. Callam, and N. Maclaren from Active List (Supern.), to be Lt.-Cols.

Maj. H. K. Griffith from Active List (Supern.), to be Maj.

Capt. J. V. Holmes, from the Active List, to be Maj.

Capt. J. K. Davies, from the Active List, to be Capt.

INDIAN MEDICAL SERVICES.

Col. L. Humphreys to be Asst. Director of Medical Services, Baluchistan District, vice Col. A. H. Safford, Lt.-Col. H. J. Crossley to be officiating A.D.M.S., U.P. District, vice Col. A. B. Fry on leave. Capt. D. J. Batterham, to be Specialist in Radiology, Burma District, vice Maj. W. J. Dunn. Capt. C. A. Whitfield to be officiating Specialist in Surgery, Poona District, Secunderabad, vice Capt. O. B. C. Anderson. Lt. W. A. Khan to be Specialist in Ophthalmology, Baluchistan District, vice Maj. S. D. Sondhi. Capt. A. I. Cox officiates as Officer Commanding Indian Military Hospital, Loralai, and Maj. R. Lee officiates as Senior Medical Officer, Zhob Independent Brigade Area. Lt.-Col. J. D. Sandes, officiating Prof. of Clinical Medicine, Medical College, Calcutta, to act as Principal, vice Lt.-Col. F. A. F. Barnardo, on leave. Col. G. Tate to be President of the Governing Body of the State Medical Faculty, vice Lt.-Col. J. C. Leicester. Dr. Baijnath has been appointed on the Personal Staff of the Viceroy, vice Khan Bahadur Nazir Hussain, retired. Lt.-Col. W. R. Batty has resumed charge as Residency Surgeon, Indore. Lt.-Col. A. N. Dickson has been posted as Residency Surg., Hyderabad. Dr. Sukumar Sanyal, Assistant Surg. in Charge of the Main Hospital, Bilaspur, has been appointed to officiate as Civil Surg. Seoni, vice Dr. Narbada Prasad Shriastava, transferred to Nagpur. Dr. A. F. C. Gomes, officiating Civil Surg., Akola, has been appointed temporarily to the Medical Charge of the District Jail, Akola, vice Lt.-Col. G. Fowler, on leave. Dr. Sukumar Sanyal, officiating Civil Surg., Seoni, has been appointed to the Executive and Medical Charge of the Subsidiary Jail, Seoni. Lt.-Col. E. G. A. Mathews, Civil Surg., from Hardoi to Aligarh. Lt.-Col. H. Ross, Civil Surg., from Aligarh to Cawnpore.

DEATHS IN THE SERVICES.

Lt.-Col. Edward Temple Harris, D.S.O., I.M.S., who died on May 24th at Maymyo, Burma, was the son of Dr. A. B. Harris, who served during the Crimean War and who died at Falmouth last year at the age of 92. Born in 1878, Lt.-Col. Harris graduated in medicine and surgery at Cambridge and was a medical student at Middlesex Hospital, and received his first commission in the I.M.S. in 1903. Subsequently he was gazetted to civil employment in Burma, and in 1906 was medical officer to the 16th Rajputs (the Lucknow Regiment). During the late war he served with the East African Expeditionary Force and was present at the battle of Tanga (mentioned in dispatches and D.S.O.). He married in 1905 Eva Russell, daughter of the late Canon Brian Christopherson, rector of Falmouth, by whom he had two sons.

Correspondence.

"Audi alteram partem."

THE LOCAL ADMINISTRATION OF MENTAL DEFICIENCY.

To the Editor of THE LANCET.

SIR,—Will you allow me to comment upon the memorandum recently issued by the Society of Medical Officers of Health relating to mental deficiency administration and strongly attacking what is conceived to be the attitude and policy of the Board of Control. I do not propose to refer in detail to this memorandum; I would merely say that its perusal seems to indicate the existence of so much misunderstanding regarding the report of the Board of Control; its attitude towards the Board is so markedly hostile, and its language so intemperate—indeed, one might not unfairly say so offensive—that one cannot but wonder how it came to be passed by the Society. This tone is all the more unfortunate since the charge may well be made that those responsible for it do not occupy an entirely disinterested position concerning the chief matter at issue.

With the view that disease of mind should be regarded as part of disease in general I entirely agree. The progress of psychological medicine in the past has suffered greatly from the failure to appreciate this relationship, and one of the most satisfactory features of recent years has been the gradual breaking down of the artificial barrier which has long existed between disease of mind and disease of body. Further, I entirely agree that the administration of the various Acts dealing with mental disease should, so far as is possible, form part of the Public Health Service, and that there should be the closest coördination of all the branches of this service. But the memorandum goes on to suggest—indeed, to claim—that this coördination can only be secured by placing the administrative control of all these services in the hands of *one individual*—namely, the medical officer of health—and it is here that I venture to demur.

My objection to this policy of the creation of the post of Pooh-Bah is based upon the deliberate opinion that, owing to the developments in medicine which have taken place in recent years, it is no longer possible for any single individual to possess that knowledge of all its branches which is necessary for efficient administration. There are certain branches—such, for example, as those dealing with venereal disease, tuberculosis, infectious diseases, inspection and treatment of school-children—an adequate knowledge of which is possessed by every well-educated medical practitioner. The administration of these services may well remain in the hands of the chief medical officer, the actual work being done by special assistants. But there are other branches of work in which this is not so, and this is peculiarly the case with mental disease. I have no hesitation in saying that the successful ascertainment, diagnosis, treatment, and administrative disposal of persons suffering from disorder, disease, or defect of mind can only be made by a practitioner who has spent years in the study of these conditions, and that there are very few, if any, medical officers of health who possess either the special knowledge, the experience, or even the time to do this work. Here also the work could doubtless be delegated to an assistant possessing the necessary qualifications; but to secure efficiency of administration it would be essential that such subordinate officer should be given a considerable degree of freedom, that his initiative should be encouraged and, most important, that he should be in personal contact with, and responsible to, the Statutory Committee of the Council charged with this duty. I hold no brief for the Board of Control, but so far as I understand their attitude this is all they ask for. They appear to be of the opinion that part, at all events, of the failure of local authorities to administer the Mental Deficiency Act is due to this work having been relegated to medical officers of health who have little interest in, less special knowledge of, and still less available time to do the work. The failure is unquestionable. The desire of the Board that the work should be in the hands of a specially qualified officer in direct touch with the Statutory Committee does not seem unreasonable.

For my part I am disposed to think that the time has come when one should go even further. Psychological medicine is not only a highly specialised subject, but it is one which in the near future must inevitably lead to more and more duties being placed upon the shoulders of local administrative authorities. It is a recognised fact that if work is to be well done it must be in the hands of those interested in, and having special knowledge of it, and I very much doubt whether real efficiency will be attained with regard to defectives and to the early and appropriate treatment of mental patients unless the administration of this branch of medicine is made a separate department under its own chief. There are plenty of young well-qualified members of the profession taking up this special work, but they naturally hesitate to enter the service of local authorities because, so long as they so specialise, they can never attain to more than a subordinate position. This is good neither for progress nor for efficient administration, nor is it in the interests of the profession generally.

It may be suggested that the creation of such a separate department would be to undo the work of coördinating the various public health services, and contrary to the aim of the Ministry of Health Act of 1919. I do not think so. The aim of that Act was to secure coördination by placing administrative control in the hands of *one and the same Council*, and not in the hands of one particular official (i.e., the medical officer of health), of that Council, and I see no reason why coördination should in any way suffer by the heads of the respective departments being colleagues meeting one another on equal terms. Such an arrangement would certainly be more likely to attract practitioners specialising in psychological medicine, and would thereby make for greater efficiency and the advantage of the community.

I am, Sir, yours faithfully,

New Cavendish-st., W., June 13th. A. F. TREDGOLD.

THE EMPLOYMENT OF MARRIED WOMEN.

To the Editor of THE LANCET.

SIR,—I enclose a copy of a letter addressed by the Medical Women's Federation to the members of the Durham County Council, regarding the recent resolution passed by them prohibiting the employment of married women in the county service. The executive committee of the Federation beg me to request you to publish this protest.

I am, Sir, yours faithfully,

VIOLET KELYNACK,
Medical Secretary, Medical Women's Federation.

9, Clifford-street, W., June 13th, 1927.

The enclosed letter to the members of the Durham County Council is as follows:—

DEAR SIRS,—The Council of the Medical Women's Federation has learned with the deepest regret that the Durham County Council has decided to debar from employment on its staff all married women, medical and otherwise, whose husbands are in the receipt of an adequate income. The Medical Women's Federation has always upheld the principle that considerations affecting efficiency of work should alone govern the appointment or dismissal of medical officers, and believe that this principle is in accordance with the true interests of the community.

They would venture to point out that without the enactment of special restrictions, it is always open to an appointing authority to select unmarried rather than married candidates where they consider marriage is likely to act as a handicap to their work. What the new regulation will do is to keep out of sight all possible married candidates, including it may be, women of exceptional ability and experience, or in regard to whom the handicap of marriage may be comparatively slight—i.e., married women without children, or where children have reached an age to make

little demand on the mother's time. The consideration of special cases, where the compensatory advantages may largely overbalance the possible handicap of marriage, is debarred. The rule also ignores completely the undoubted fact that in medicine, and other professions also, there are branches where the personal experience gained by marriage and motherhood adds to the value of the worker, as, for instance, in baby welfare work. For these reasons we feel strongly that this regulation does not tend to the maintenance of the maximum efficiency of work or to the appointment in all cases of the best qualified candidates.

We quite appreciate the point of view which wishes to distribute the employment available amongst as many households as possible, where compatible with efficiency, but if economic reasons of this kind are to be taken into consideration in making appointments, they ought to be made to apply to men also who possess, for instance, private means or a wealthy wife. One point that we think is often overlooked is that married medical women, at any rate, who remain in employment after marriage, are obliged to employ at least one woman to look after their households, and if they have families often two or more people who would not be employed if the mother were at home. Married women, and we think this especially true of married medical women, who remain in employment after marriage, usually do so, not because of the enhanced income, but because they like their work and are peculiarly efficient at it, and they distribute often the whole of their earnings in wages and salaries to others.

We trust that the Council will favourably consider this protest. It is sent because we feel strongly that prohibitive regulations of this kind are grossly unfair to women who have given years of work and devotion to their profession and also to the public, who are often deprived thereby of the services of tried and skilled workers.

Yours faithfully,

CHRISTINE M. MURRELL, President.
FRANCES IVENS, Past-President.
CLARA STEWART, ELLEN B. ORR } Vice-Presidents.
JANE H. WALKER, Hon. Treasurer.
June 1st. F. MAY DICKINSON BERRY, Hon. Secretary.

THE SURGERY OF HERNIA.

To the Editor of THE LANCET.

SIR,—In a letter which appeared in THE LANCET on May 21st (p. 1107) Dr. J. P. zum Busch has challenged my statement that Celsus himself operated. But Leigh Watson, of Chicago, who has studied the subject of hernia most exhaustively, writes: "Celsus operated extensively on umbilical hernias, &c." In the English translation of the works of Celsus, by James Grieve (1814), a detailed description of the operation of herniotomy is given (Lib. vii., chap. 20, page 354). It is impossible to imagine that such a fine description, including all the technical details, could be given by a mere lay writer. There is, in fact, ample internal evidence in the works of Celsus that he actually practised surgery. Le Clerc, in his Histoire de la Médecine (Paris, 1760), describes the practice of Celsus in the treatment of various diseases. For example, a splendid description is given of a "new method in the suture of abdominal wounds." Part II., lib. iv., sect. ii., chap. 5, p. 239). No one but an operating surgeon could have written such a fine technical account.—I am, Sir, yours faithfully,

Wimpole-street, W., June 13th, 1927. E. M. COWELL.

PSYCHOGENIC ASTHMA.

To the Editor of THE LANCET.

SIR,—In THE LANCET of May 7th Dr. E. B. Strauss reports the cure by psychotherapy of two cases of asthma, which he regards as psychogenic. Dr. Strauss was unable to trace the psychogenesis to the sex instinct; whether a complete analysis would have discovered sexual factors it is impossible to say. The fact is that the symptom disappeared without the patients being made conscious of sexual fixations or traumata. While the cases as reported give no evidence of the decisive importance of sexual factors, they are a striking witness to the traumatic results of actual experiences of dyspnœa—produced in the one case by a rag stuffed in the mouth by a nurse, in the other case by the water when the child fell into a stream. While the theory of Freud seems insufficient to explain such reactions to dangerous stimuli, these psychogenic cases can be more clearly understood in the light of the recent development of Freudian theory by Rank, who discovered the importance of the trauma of birth in human development. It is true that the average human being, in Rank's view, overcomes the painful experiences of birth and weaning; but in cases where later traumata occur, such as those in Dr. Strauss's patients, the anxiety of the primal trauma can be associatively revived to cause symptoms. The birth shock only becomes pathogenic in persons whose libido development has later been checked in the attempt to find substitutes for previous satisfactions lost by such experiences as painful weaning, the painful presence of rivals, or painful accidents and punishments. The reaction to these traumata may be a neurotic anxiety affect or part of its physiological accompaniment such as dyspnœa.—I am, Sir, yours faithfully,

San Francisco, May 19th, 1927. CAVENDISH MOXON.

ACUTE HEPATIC ABSCESS.

To the Editor of THE LANCET.

SIR,—The interesting account of two cases of acute hepatic abscess reported by Mr. T. J. D. Lane and Dr. T. A. Austin in your last issue prompts me to put on record a somewhat similar case under my own care which is now doing well after operation.

A lady, aged 44, had had definite symptoms of cholecystitis for at least two years. Latterly her condition had become worse, her temperature rose regularly at night to 100°–101° F., her sclerotics were slightly tinged, and there was definite tenderness over the right upper abdomen. She was very averse to operation and demanded X ray confirmation of gall-bladder trouble before submitting to laparotomy. This was duly done by Graham's method. The gall bladder showed as a very ill-defined shadow, but on one of the films a definite racemose shadow was discernable over the gall-bladder area. The radiologist gave his diagnosis "cholecystitis with gall-stones present."

On opening the abdomen the first thing I noticed was a moderately enlarged and congested liver; on examining its inferior surface five small pale areas were seen bulging out, and these fluctuated to the touch. The general peritoneal cavity having been packed off the bulging areas were incised and from each of them pus oozed out. The gall-bladder was then examined; it was small in size and showed slight evidence of cholecystitis. I decided to drain it through the main abdominal wound. No gall stones were present. A stab wound was then made in the flank and through this a wide strip of corrugated rubber was passed to the area of the liver in which the abscesses were present.

It is now four weeks since the operation and the patient has so far done well. The tube came out of the gall-bladder on the tenth day and the stab wound drained a mixture of bile and pus for 15 days, when it was removed.—I am, Sir, yours faithfully,

Darlington, June 13th. DAVID R E. ROBERTS.

A POINT UNDER THE MIDWIVES ACTS.

To the Editor of THE LANCET.

SIR,—In reference to my letter which appeared in your issue of May 28th under the above heading, the county medical officer to the Devon County Council informs me that when the Act of 1926 came into force every medical practitioner in the county was duly notified of the provision referred to in accordance with the circular of the Ministry of Health relative thereto. Through the lapse of time, however, the position has arisen that some medical practitioners in the county of Devon (and doubtless in other counties) have not received any notification. Bearing in mind that such documents are easily forgotten, the reasonable procedure to obviate the difficulty would be to print a notice on the forms supplied for making claims in respect of midwifery fees, indicating clearly that they must be rendered within two months of the time when the services are rendered.

I am, Sir, yours faithfully,

HUGH WOODS.

London and Counties Medical Protection Society, Ltd., Victory House, Leicester-square, W.C., June 9th.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At an ordinary meeting of the Council held on June 9th, with Sir Berkeley Moynihan, the President, in the chair, the following examiners were elected for the undermentioned examinations:—

Primary Fellowship (Physiology).—Prof. R. J. S. McDowall and Prof. C. A. Lovatt Evans.
Second Conjoint (Physiology).—Dr. D. H. de Souza.
Final Conjoint (Midwifery).—Dr. T. B. Davies.
Diploma in Public Health (Part II.).—Dr. C. W. Hut.t
Diploma in Ophthalmic Medicine and Surgery (Part II).—Mr. Reginald A. Greeves.
Diploma in Laryngology and Otology (Part I.).—Mr. W. Mayhew Mollison.

Sir Berkeley Moynihan was re-elected as representative of the College on the Court of Governors of Sheffield University for three years.—A vote of thanks was given to Miss Hunter, of Blackheath, for presenting to the College a combined bookcase and writing-table, formerly the property of John Hunter.—The thanks of the Council were expressed to Sir John Bland-Sutton, on his retirement, for his services during his term of office on the Council extending over 17 years, including three years as President.

As the result of the recent Final Fellowship Examination, held from May 19th to June 3rd, for which 108 candidates presented themselves, 25 candidates (24 men and 1 woman) were approved. One candidate, Harry I. Deitch (Middlesex Hospital) although successful, is not entitled to the diploma until he has attained the requisite age. The Council accordingly conferred the diploma of Fellow upon the following 24 candidates who have complied with the necessary by-laws:—

H. G. Armstrong, Toronto; Alfreda H. Baker, Belfast; H. B. Bullen, Cambridge and St. Bart.'s.; W. K. Connell, Glasgow and London; W. H. A. Dodd, Liverpool and Guy's; R. L. Dodds and I. J. Fraser, Belfast; W. H. Gervis, Cambridge and St. Thomas's; C. M. Gwillim, St. Bart.'s and St. George's; W. J. Henry, Toronto and London; R. V. Hudson, Middlesex; D. McKelvey, Edinburgh and Guy's; W. A. Mill, Guy's; J. D. R. Murray, Cambridge and Middlesex; M. A. Paul, Ceylon and King's Coll.; G. H. Pitt, Guy's; W. A. Richards, Charing Cross; E. W. Riches and E. L. Robert, Middlesex; J. Roberts, Liverpool and London; F. W. Roques, Cambridge and Middlesex; S. V. Unsworth, Liverpool; A. L. Walker, Cambridge and Middlesex; and E. Wolff, Univ. Coll.

The diploma of M.R.C.S. was also conferred upon the following candidates who have passed the requisite examinations and have now complied with the by-laws:—

V. F. Anderson, Westminster; F. A. J. Bouloux, Univ. Coll.; Ethel E. M. Ogilvie, Dulcie J. Peake, Winifred M. Turner, and Joan B. Walker, Royal Free.

UNIVERSITY OF BRISTOL.—At recent examinations the following candidates completed the undermentioned examinations:—

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—G. D. J. Ball, O. J. P. Bollon, T. L. Cleave, R. D. Jenkins, Helen B. Murgoci, Ethel M. Redman, and Phœbe C. Vine.
Part II.—Helen M. Aldwinckle, J. C. Batt, H. E. C. Bentley, E. C. Bernard, G. L. Feneley, Ernest May, E. S. Rogers, J. R. E. Sansom, and Maiprom Srisvasti.

FINAL EXAMINATION FOR DENTAL DIPLOMA.

H. G. Clapp, E. J. Tanner, G. W. Vowles.

ROCKEFELLER MEDICAL FELLOWSHIPS. — The Medical Research Council announce that on behalf of the Rockefeller Foundation they have made the following awards of Medical Fellowships provided by the Foundation and tenable in the United States of America during the academic year 1927–28. These Fellowships are awarded to graduates who have had some training in research work either in the primary sciences of medicine or in clinical medicine or surgery, and who are likely to profit by a period of work at a university or other chosen centre in America before taking up positions for higher teaching or research in the British Isles:—

Robert William FitzGerald Collis, M.B. Camb., M.R.C.P. Lond. (resident medical officer, King's College Hospital, London).
David Krestin, M.D., M.R.C.P. Lond. (medical registrar, London Hospital).
Geoffrey Lewis Peskett, M.A. Oxf. (demonstrator in biochemistry, University of Oxford).
Isabella McDougall Robertson, M.D. Lond. (research worker in the pathological laboratory, Maudsley Hospital, London).
*Thomas Tennent, M.B. Glasg. (assistant medical officer, Maudsley Hospital).
Edgar William Todd, M.D. Camb. (research worker in the inoculation department, St. Mary's Hospital).

* Dr. Tennent has been appointed on modified conditions while holding a scholarship from another source.

UNIVERSITY OF DUBLIN.—It is proposed to confer honorary degrees on June 28th upon Sir Humphry Rolleston, of Cambridge, and Prof. Harvey Cushing, of Harvard.

Trinity College: School of Physic.—The Fund subscribed by the medical graduates of the University to commemorate the bicentenary of the foundation of the School of Physic has now been handed to the Board of Trinity College, for the purpose of establishing a bicentenary memorial prize to be awarded each year to the winner of the medical or surgical travelling prize. In accepting the Fund the Board has expressed thanks to the subscribers for "a very generous benefaction to the College." The amount of the Fund is about £730.

CANCER RESEARCH IN DUBLIN.—The Committee of the National Cancer Campaign (Ireland) has decided to hold its first public meeting to ask for public support on June 27th. The meeting will be held in the Royal College of Surgeons, and the chair will be taken by the Marquis of Dufferin and Ava, while among the speakers will be Sir Humphry Rolleston and Prof. Harvey Cushing.

GLASGOW UNIVERSITY CLUB, LONDON.—The annual summer dinner of this club will be held at the Trocadero Restaurant, Piccadilly, W. 1, on Friday, July 1st, Dr. Charles O. Hawthorne in the chair. Any Glasgow University men who, though not members of the club, desire to attend, are requested to communicate with the honorary secretaries, at 62, Harley House, London, N.W. 1.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—The annual oration of this society (which incorporates the London Dermatological Society) will be delivered at 5 P.M. on Wednesday, June 22nd, at St. John's Hospital, Leicester-square, by Dr. H. Haxthausen, of Copenhagen. His subject will be Streptococcic Pityriasis. The oration will be followed by the annual general meeting.

THE LATE DR. A. E. NORMINGTON.—On May 27th, at the age of 55, Dr. Arthur Edward Normington died at Rhos-on-Sea, where he had been living in retirement since the early part of this year. He was born at Keighley, and educated first at the local grammar school and later at Owens College, graduating in medicine with honours at the Victoria University of Manchester in 1896. In the same year he won the medical and surgical clinical prize at the Royal Infirmary, Manchester, and after qualification he was appointed prosector and assistant demonstrator of anatomy at Owens College. A short period was then spent as resident medical officer at Stoke Union Hospital, after which, about 27 years ago, he settled in practice at Nelson, Lancashire. At first he acted as assistant to Dr. W. E. Little, whose practice he later took over. Dr. Normington took a keen interest in ambulance work, and during the war was commandant of Reedyford Auxiliary Military Hospital, which later, largely as a result of his efforts, was turned into a memorial hospital for the use of the town. He was appointed a Member of the Order of the British Empire in recognition of his war services, and in 1920 was made a magistrate. He leaves a widow, two sons, and one daughter.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Monday, June 20th, at 2.30 P.M., Dr. A. J. Whiting will give a medical clinical demonstration at the Prince of Wales's Hospital; on Wednesday, June 22nd, at 4 P.M., Mr. C. A. Joll will give a surgical demonstration at the Royal Free Hospital on the Surgical Treatment of Goitre; on Friday, June 24th, at 3 P.M., Mr. Griffith will give a clinical ophthalmic demonstration at the Royal Eye Hospital. These demonstrations will be free to members of the medical profession. On June 27th a fortnight's course will begin at the City of London Hospital for Diseases of the Heart and Lungs. (Fee £2 2s.) In July five special courses will be given in various subjects. The first will be an all-day course from July 4th to 16th at the National Hospital for Diseases of the Heart. The daily sessions will begin at 10 A.M. and last until 4 P.M.; the numbers are strictly limited to 20. On July 11th the Prince of Wales's Hospital group will start a fortnight's course in general medicine, surgery, and the specialties, from 10.30 A.M. to 5.30 P.M. daily. On the same date a week's course will begin at the St. Mark's Hospital for Diseases of the Rectum, occupying six afternoons and three mornings. The other two courses taking place in July are part-time courses—viz., a month's course in neurology at the West End Hospital for Nervous Diseases, starting on July 4th and consisting of lecture-demonstrations at 5 P.M. daily; and a course in infectious fevers at the Park Hospital, on Wednesdays at 2.30 P.M., and Saturdays at 11 A.M., from July 13th to 30th. A general course of work, for which a separate programme is issued, is also provided by the Fellowship at the associated hospitals. Copies of all syllabuses and of the *Post-Graduate Medical Journal* may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

THE death is announced, on June 11th, of Dr. Alexander Hugh Freeland Barbour, who was at one time President of the Royal College of Physicians of Edinburgh, and was physician to the gynæcological department of Edinburgh Royal Infirmary.

MEDICO-LEGAL SOCIETY.—The annual general meeting of this society will be held at 11, Chandos-st., London, W., on Thursday, June 23rd, at 8.30 P.M. At the conclusion of business Lord Riddell will read a paper on the Law and Ethics of Medical Confidences. A discussion will follow.

RESEARCH DEFENCE SOCIETY.—The annual general meeting will be held at the house of the Medical Society of London, 11, Chandos-street, Cavendish-square, W. 1, on Tuesday, June 21st, at 3 P.M., when Lord Lamington will take the chair. Prof. Julian Huxley will give the first Stephen Paget Memorial Lecture, his subject being Research and the Community.

ST. BARTHOLOMEW'S HOSPITAL.—Sir Berkeley Moynihan, President of the Royal College of Surgeons of England, has accepted an invitation to take charge of the work of the Surgical Professorial Unit at St. Bartholomew's Hospital and Medical College from June 15th to 30th. On previous occasions Prof. Harvey Cushing, of Harvard University, and Prof. Hugh Cabot, of Ann Arbor University, have accepted similar invitations to the hospital.

KING'S COLLEGE MEDICAL SOCIETY.—A Lister Memorial Lecture will be delivered at King's College, Strand, London, by Sir StClair Thomson, on Thursday, June 23rd, at 5 P.M. The chairman will be Sir Arthur Keith, F.R.S. The lecture is primarily intended for the medical students of London who were unable to attend the official celebrations held during the Easter vacation. At 4.50 P.M. a wreath will be placed on the memorial tablet outside the chapel by the President of the Medical Society.

LIVINGSTONE COLLEGE.—On June 10th Commemoration Day was celebrated at the College. The Chairman was Sir John Rose Bradford, President of the Royal College of Physicians, who spoke of the recent great advance in the work of hospitals, in the technique of medicine, in the recognition and treatment of disease, and further still, in the work of nurses and almoners, who had to receive some medical training before they could carry out their duties efficiently. This showed that the attitude of the medical profession to those outside it had altered somewhat of late; there was not the same feeling of mystery over the profession as in former days, and it was recognised that the problems of medicine were so urgent and difficult and complex that all the aid was required that could possibly be got. While expert professional knowledge was essential as regards the treatment of disease, it was very necessary that there should be knowledge of lesser degree, and medicine owed a lot to such people as missionaries who, without any expert knowledge of medicine, had yet, thanks to the training that they had received at such colleges as Livingstone College, rendered a great service to medicine. A little knowledge was capable of being of great service. He had been much impressed by the reports he had read from students of the College in all parts of the world. As missionaries they were often in situations where medical aid could not be got, and the training they had received was of immense value not only in treating but in preventing disease.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—The annual general meeting was held at Victory House, Leicester-square, London, W., on June 8th, Sir John Rose Bradford, the President, being in the chair. In proposing that the annual report and statement of accounts should be adopted, the President called attention to the increase in the work of the Society and the gravity of some of the cases which they had had to defend. The membership of the Society had increased considerably, being now in the region of 10,000. Even now the membership of this Society and its sister society did not account for more than about 50 per cent. of the medical profession of the country. That those who did not join a defence society ran very great risks was exemplified in one or two recent cases. The President emphasised the importance of members in any difficulty coming first to the Society before taking any action, and of making full use of X ray examination in the treatment of fractures. The President referred to the large accumulated fund recorded in the financial statement, which fund made it possible to conduct to a successful issue very expensive cases. Dr. C. M. Fegen, in proposing the re-election of Sir John Rose Bradford as President, referred to his untiring efforts on behalf of the Society. Mr. P. Sidney Spokes seconded the motion, which was carried unanimously, as was also a motion for the re-election of Vice-Presidents, members of council, and other officers, a special vote of thanks being given to the Society's solicitors, Messrs. Le Brasseur and Oakley.

Parliamentary Intelligence.

HOUSE OF COMMONS.

MONDAY, JUNE 13TH.

Exchequer Grants to Voluntary Hospitals.

Mr. LUNN asked the Minister of Health the total amount allocated from the Exchequer in aid of voluntary hospitals since 1918; and whether the Voluntary Hospitals Commission was still in existence and had the power to give further financial assistance, and to what extent.—Sir KINGSLEY WOOD replied: Excluding contributions towards specific grant-aided services, the total Exchequer grants in aid of the general expenses of voluntary hospitals since 1918 have amounted to £500,000 voted by Parliament on the recommendation of Lord Cave's Committee. The voluntary Hospitals Commission is still in existence, but it has no funds at its disposal.

Amendment of Law of National Health Insurance.

Captain FRASER asked the Minister of Health if, in view of the fact that ex-Service men who were new entrant voluntary contributors under the Widows', Orphans', and Old Age Contributory Pensions Act, 1925, must be regarded as subject to a reduction of sickness and disablement benefit while in receipt of a 100 per cent. pension or allowances unless they had satisfied the requalification conditions of Section 60 (1), Provision (1) and (2), of the National Health Insurance Act of 1924 during their previous period of insurance, he would undertake that an amendment of the law would be made forthwith in order to relieve approved societies of the penalties arising from over-payment which they had in good faith already made.—Sir KINGSLEY WOOD replied: It is intended to include in the amending Health Insurance Bill arising out of the report of the Royal Commission provision to meet the difficulty to which the hon. and gallant Member calls attention.

TUESDAY, JUNE 14TH.

Poor-law Relief.

Mr. LUNN asked the Minister of Health the number of able-bodied men and women in receipt of Poor-law relief in the months of January, February, March, and April, 1926 and 1927.—Mr. CHAMBERLAIN replied: Figures based on a classification distinguishing "able-bodied" persons are not now obtained. The average numbers of males over 16 years of age ordinarily engaged in some regular occupation, and the average numbers of females over 16 years of age who were ordinarily so engaged or were the dependent wives of men ordinarily so engaged who were in receipt of domiciliary Poor-law relief in England and Wales during the months of January, February, March, and April, 1926 and 1927, were as follows:—

Average Numbers.

	1926.		1927.	
	Males.	*Females.*	*Males.*	*Females.*
January ..	150,448	135,953	177,054	153,800
February ..	149,648	133,914	159,451	137,201
March	145,691	129,786	150,644	129,255
April	142,048	125,775	141,311	121,874

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 4TH, 1927.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 254 (last week 266); scarlet fever, 1671; diphtheria, 792; enteric fever, 59; pneumonia, 1036; puerperal fever, 36; puerperal pyrexia, 102; cerebro-spinal fever, 11; acute poliomyelitis, 1; acute polio-encephalitis, 3; encephalitis lethargica, 28; continued fever, 2; dysentery, 6; ophthalmia neonatorum, 125.

Cases of small-pox were notified from the counties of Derby 4, Durham 150, Lancaster 7, Northumberland 6, Yorks. North Riding 2, West Riding 48, Monmouth 37. None was reported from London, Kent, Middlesex, Nottingham, Stafford, Surrey, or Glamorgan.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 1 (0) from enteric fever, 35 (1) from measles, 5 (1) from scarlet fever, 30 (7) from whooping-cough, 26 (9) from diphtheria, 49 (10) from diarrhœa and enteritis under two years, and 42 (7) from influenza. The figures in parentheses are those for London itself.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, June 21st.—5.30 P.M., General Meeting of Fellows.
THURSDAY.—8.30 P.M., UROLOGY: Demonstration: Mr. Frank Kidd: A Series of Specimens illustrating the Range of the Operation of Nephro-Ureterectomy.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, June 21st.—5 P.M., Sir F. Gowland Hopkins: The Task of Biochemistry. (Last Croonian Lecture.)

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, June 20th.—2.30 P.M. to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 P.M. to 5 P.M., Medical Surgical, Throat, Nose, and Ear Clinics. Operations.
WEDNESDAY.—2.30 P.M. to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinic. 2.30 P.M. to 5 P.M., Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics. 2.30 P.M. to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations. 4.30 P.M., Special Demonstration on selected cases of Nerve Diseases.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, June 20th, to SATURDAY, June 25th.—FELLOWSHIP OF MEDICINE DEMONSTRATIONS. Mon., at 2.30 P.M., at Prince of Wales's Hospital, medical demonstration by Dr. A. J. Whiting. Wed., at 4 P.M., at the Royal Free Hospital, surgical demonstration by Mr. C. A. Joll on Surgical Treatment of Goitre. Fri., at 3 P.M., at Royal Eye Hospital, ophthalmic clinical demonstration by Mr. Griffith. The demonstrations are free to all members of the medical profession.—BLACKFRIARS SKIN HOSPITAL, Blackfriars, S.E. Course of instruction in the Out-patient Department every afternoon from 2.30 P.M. A special demonstration of interesting cases will be given on Tues.—CHILDREN'S CLINIC, Cosway-street, N.W. Lectures and demonstrations on Diseases of Children. Afternoons and some mornings. Further information from the Secretary.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, June 21st.—5 P.M., Dr. J. E. M. Wigley: Napkin-Area Eruptions in Infants.
THURSDAY, June 23rd.—5 P.M., Dr. W. Griffith: Bullous Eruptions.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, June 23rd.—4 P.M., Dr. Nabarro: Vaccine Therapy.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, June 21st.—3.15 P.M., Mr. C. L. Gimblett: Eye Disease as a Complication of Sepsis Elsewhere.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.
WEDNESDAY, June 22nd.—5 P.M. (St. John's Hospital, Leicester-square), Annual oration by Dr. H. Haxthausen (Copenhagen): Streptococcal Pityriasis.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
TUESDAY, June 21st.—3.30 P.M. (at the Jessop Hospital), Mr. Stacey: Treatment of Pelvic Inflammation.
FRIDAY.—3.30 P.M. (at the Royal Infirmary), Mr. Finch: Clinical Cases.

Appointments.

SHORE, L. R., M.B., B.Chir. Camb., has been appointed Lecturer in Anatomy, Witwatersrand University, Johannesburg.

Liverpool Cancer Hospital: RAMSDEN, Prof. W., M.D., B.Ch. Oxf., Honorary Consulting Biochemist; and ROBERTS, R. E., B.Sc., M.D. Liverp., Honorary Consulting Radiologist.

Certifying Surgeons under the Factory and Workshop Acts: SWEETNAM, T. C. A., M.D., B.Ch. Dub. (Hemsworth, W. Riding); CAMPBELL, J. (Birtley, Durham).

Vacancies.

For further information refer to the advertisement columns.

Barry, U.D.C. Accident and Surgical Hospital.—H.S. At rate of £200.
Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.
Bristol General Hospital.—Hon. Asst. S. to Ear, Nose and Throat Dept.
Bury Infirmary.—Third H.S. At rate of £150.
Cambridge, Addenbrooke's Hospital.—Cas. O. At rate of £130.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
City of London Hospital for Diseases of the Heart, Victoria Park, E.—Asst. Tuberculosis O. £600.
East London Hospital for Children, &c., Shadwell, E.—Res. M.O. £200.
Federated Malay States, Central Mental Hospital.—Second Asst. Med. Supt. £700.
Finsbury Metropolitan Borough.—Asst. M.O.H. £700.
Golden-square, Throat, Nose and Ear Hospital.—Hon. Anæsthetist.
Huddersfield, Storthes Hall Mental Hospital, Kirkburton.—Jun. Asst. M.O. £400.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. and Cas. O. £100.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
London Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100. Also Cas. O. At rate of £120.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.
Manchester, Ancoats Hospital.—Res. M.O. At rate of £150.
Manchester, Crossley Sanatorium, Delamere Forest, Cheshire.—Asst. M.O. £200.
Merseyside Borough Health Education Committee.—Lecturer Organiser. £400 for six months.
Middlesex Hospital Medical School, London, W.—Second Demonstrator for Physiology Dept. £350.
Middlesex Hospital Medical School, Bland-Sutton Institute of Pathology.—Asst. for Cancer Research. £350.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. and H.S. £150 and £125 respectively.
Ministry of Health.—M.O. £600.
Northampton County Borough Education Committee.—Asst. Sch. Dentist. £450.
Nottingham Children's Hospital.—Res. H.S. At rate of £150.
Penshurst, Kent, Cassel Hospital for Functional Nervous Disorders. Res. M.O. £350.
Reading, Royal Berkshire Hospital.—H.P., Second H.S., Third H.S. Each at rate of £150.
Royal Army Medical Corps.—Commissions.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100. Also Asst. Radiologist. £50.
Royal Westminster Ophthalmic Hospital, King William-street, West Strand, W.C.—Refraction Asst. At rate of £100.
St. Helens County Borough.—Deputy M.O.H. £700.
St. Mark's Hospital for Cancer, &c., City-road, E.C.—Clin. Assts.
St. Marylebone General Dispensary, 30, Marylebone-lane, W.—Hon. S. to Ear, Nose, and Throat Dept.
Salford Royal Hospital.—H.P. and H.S.'s. Each at rate of £125.
Sheffield, Jessop Hospital for Women.—Two Asst. H.S.'s. Each at rate of £100.
Sheffield Royal Infirmary.—H.P. At rate of £80.
Shotley Bridge, Mental Deficiency Colony.—M.O. £50.
Southampton, County of.—Medical Adviser. £700.
Southampton, County Borough.—Asst. M.O.H. £600.
Southampton, Royal South Hants and Southampton Hospital.—H.P. £150.
South London Hospital for Women, Clapham Common, S.W.—Asst. P.
Sutton, Surrey, Downs Hospital for Children.—Jun. Asst. M.O. £500.
University of London.—External Examinerships.
Warwickshire County Council.—Asst. County M.O.H. £600.
Worksop, Victoria Hospital.—H.S. At rate of £170.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Great Haseley, Oxfordshire, and Filey, York, E.R.

Births, Marriages, and Deaths.

BIRTHS.

CROOK.—On June 5th, at South Eaton-place, London, S.W., the wife of Eric A. Crook, F.R.C.S., of a daughter.
DAVIDSON.—On June 6th, at a nursing home, Bournemouth, the wife of A. Whyte Davidson, M.B., F.R.C.S. Edin., of a son.
MILLER.—At Streatham Manor Nursing Home on June 9th, to Emily, wife of R. S. Miller, M.D., of Cairo—a son.

DEATHS.

BARBOUR.—On June 11th, at Charlotte-square, Edinburgh, suddenly, Alexander Hugh Freeland Barbour, M.D., LL.D., of Gryffe, Bridge-of-Weir.
LISTON.—On June 11th, at a nursing home in London, following an operation, Walter Lawrence Liston, M.D., of Hereford House, Tewkesbury, aged 58.
NORTH.—On June 6th, at Worthing, Edward North, C.B., Colonel, A.M.S. (retd.), aged 70.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The thirteenth annual conference of this Association will be held in the Great Hall, British Medical Association House, Tavistock-square, London, W.C. 1, on Thursday, Friday, and Saturday, June 30th to July 2nd. It will be open to all persons interested in tuberculosis on payment of the fee of one guinea. Mr. Neville Chamberlain, Minister of Health, will open the Congress at 10.30 A.M. on June 30th, after which Sir John Robertson will give an address on Present Lines of Attack on Tuberculosis: their Relative Value. A discussion on Housing: Home Conditions, will follow. On July 1st there will be a discussion on Housing: Industrial Conditions. Visits have been arranged to various places in the neighbourhood of London.

Notes, Comments, and Abstracts.

THE CARE OF THE MENTALLY DEFECTIVE.*

BY SIR ROBERT ARMSTRONG-JONES, C.B.E., M.D., F.R.C.P. LOND.,
LORD CHANCELLOR'S VISITOR IN LUNACY.

THERE are certainly over 150,000 weak-minded persons at the present moment in England and Wales who need protection and care on account of their mental and physical infirmity. Technically, they are described as aments. They are all suffering from disease, a structural and organic defect of the brain, and are unlikely to be permanently cured. Of this number, 55,000 are admittedly in need of supervision, whilst only about 1 in 3—i.e., about 21,000, or, roughly, 1 in 8 of the total number—are actually under recognised control. These are being cared for in institutions of six kinds, which are in existence under the Mental Deficiency Act, 1913. The available accommodation may be classified as follows:—

1. *State institutions*, managed entirely by the Board of Control.—One at Rampton, near Nottingham, cares for about 500 of the most incorrigible, unmanageable, and wrongdoers of the mentally defective class. These are of all ages, they are unfit to be at large, and most of them must need permanent protection. Another institution is the one at Warwick for 50 girls. These are taught useful work, and are mainly trained for domestic service. They live together in a hostel, and their surroundings are made to correspond as much as possible with those of normal people. Some of them go to work in the neighbourhood, but live in the hostel. Their employers are fully informed of their infirmities before they are engaged, so that they may adapt themselves as far as can be to meet their defects. So successful is the training here that many of the patients obtain permanent situations, and the girls are happy, for they are encouraged to feel there is some hope for them, and that there is something to work for; in consequence there is a good feeling, good order and method, and there is no resentment against those who are placed in charge.

2. *The certified institutions* (certified by the Board of Control) include Royal Earlswood Institution, Royal Albert, at Lancaster, and Royal Eastern Counties, at Colchester. There are altogether 76 in the country; 23 of them are provided by local authorities, and the remaining 53 by philanthropic bodies and private munificence. Altogether they provide about 13,000 beds.

3. *Certified houses.*—These are owned and managed by private persons for profit, and are certified for the reception of defectives by the Board of Control. They are of the status of our private asylums and licensed houses for the insane, and they receive about 300 patients, all of whom pay for their maintenance.

4. *Approved homes* provide accommodation for about 400. The patients are either supported by relatives and friends, or are paid for by local authorities, such as boards of guardians. The homes are approved by the Board of Control.

5. *Poor-law institutions.*—Under Section 37 of the Act, the Poor-law institutions throughout the country may receive mental defectives, and there are about 6000 cases so housed. About one-third of them are in the Metropolitan Asylums Board's certified institutions in London. All the institutions mentioned are inspected by the Board of Control.

6. Lastly, there are cases under *guardianship* and those in *private care*. At the present time throughout England and Wales there are about 800 mental defectives under guardianship; among them there are nearly twice as many girls and women as there are boys and men. These cases are placed out under suitable conditions of care, control, and training. It has always been possible, where cases prove unsuited to these conditions, to transfer them back to institutions; but by an Amendment Act, 1925, it is now possible to transfer cases from institutions to guardianship—a great improvement. It is strongly urged, however, that before such a transfer is made, patients should be discharged from the institution for six months' trial on "licence," as it is called. This enables them to go into a family and to return if necessary, without the trouble of securing the "varying order," if the trial on guardianship is not a success. It is the local authority that must—if necessary—apply for the varying order to the judicial authority, and with the parents' consent. The paramount difficulty in guardianship is to find suitable guardians; the parents are sometimes very unsuitable.

* Abridged address delivered before the Brighton Guardianship Society for the Care of the Feeble-minded on May 31st, 1927.

Control and Education.

As is well known, all registered mental cases are under legal control. The Lunacy Act, 1890 and since, deals with the insane, sometimes referred to as dements. For their control a medical certificate is required (two for private patients) and a justice's order. The Mental Deficiency Act, 1913, deals with persons who are mentally defective "from birth or from an early age," described as aments. In their case, also, two medical certificates are required, together with a petition and an order.

The local education authority is bound by statute to provide free education for all children, including mentally defective children, by the Act of 1899, special schools being provided if necessary. The age for defectives is from 7 to 16. It is further the duty of the education authority to notify the local authority when certain mental defectives need subsequent supervision—i.e., when they are suitable for guardianship. Voluntary associations have undertaken the task of supervision in the case of nearly 16,000 children, which shows the immense amount of voluntary work done for this class, whilst 15,000 cases are statutory supervision cases, being visited in their own homes by paid officers, as well as by voluntary social workers. Another duty which is imposed by statute upon the local authority is described as ascertainment; they have to find out the number and names of mental defectives in their districts. Seventy-one local authorities, however, have appointed no special officers to do this work, although there is a statutory committee in each district. It is often difficult to bring these cases under the Act, unless they are being neglected, and to prove neglect is not easy even when one or both of the parents is mentally defective.

A third duty of local authorities is to provide "suitable and sufficient" accommodation for all mental defectives who are certified, or are ordered to be sent into institutions. At present this is utterly inadequate, as only 17 out of a possible 124 local authorities have so acted, and only 5000 beds have been provided. Because the amount of accommodation is so small, it is impossible to secure a proper classification of the cases, which is of paramount importance in training and treatment. So inadequate was the accommodation provided, that the Minister of Health, as far back as three years ago, urged the various local authorities (through the Board of Control) to reconsider their legal responsibility, and to submit various schemes for housing, training, and protecting the members of this class, as only accommodation for about 1 in 8 was then arranged for.

Again, not only is ascertainment a statutory obligation, but supervision and guardianship are also necessary. Yet inquiry shows that only 53 local authorities out of 124 in England and Wales have appointed their own special officers for this work, the others delegate their responsibility to voluntary associations or to health officers, relieving officers, welfare workers, district nurses, and school attendance officers. In some instances the secretary of the voluntary association has the duty of ascertainment, supervision, and guardianship, and it is a heavy task even when the official is highly trained, because the necessary information for treatment has to be obtained from many different sources. It has to be got not only from the education authority, but also from the police-courts, from probation officers, and even from the local asylums, apart from what is derived from boards of guardians or medical officers of health. Although 55,000 cases need care, accommodation is provided for 1 in 3 of these.

All weak-minded persons need protection, care, and control, not only on account of inability and incapacity to maintain an independent existence themselves, but also because, when neglected, they become a danger to the community, committing crimes, spreading disease, and often propagating their inherited deficiencies.

Epidemic Encephalitis and Its Results.

The reappearance of an old disease, described in the sixteenth century and now known as epidemic encephalitis, has given the community much anxious thought owing to its permanently disabling effects on the bodies and minds of its victims. The disease is fatal to 50 per cent. of those attacked, and most of those who survive are never the same again; about 200 of these are already in asylums, 100 more are in mental deficiency institutions, and many are wrecks and derelicts cared for in our workhouse infirmaries. Two-thirds of them are juveniles, and many of them commit anti-social acts and are to be seen in the juvenile courts. It is only recently, however, that any public authorities have provided special places for them, and only London and Lancashire have done this. There are 100 beds at Winchmore Hill, in the north of London, and there are 30 at West Park Asylum, Epsom, where the subjects of this disease are studied and where school classes, exercise, games, and suitable occupation is provided. The great difficulty has been to bring these cases under the provisions of the Act of 1913, as the disease is not "from an early age or from

birth," and Mr. Compton Wood, M.P., has brought in a Bill, acceptable to all parties, to enable cases of this kind, who must be kept a long time under supervision, to be properly cared for.

Conclusion.

Even from the standpoint of economy alone, it is most desirable that the whole class of the enfeebled in mind and body should receive care and protection, as well as supervision. It is a waste of public money for these weak-minded persons to be cared for expensively until the age of 16 and then to be thrown upon the world, when it is left to the thrifty and the prudent to support them—and often their children—either in prisons as delinquents, or as patients in hospitals and asylums. Yet this burden can be relieved by taking action. Among the measures suggested are the provision of occupation centres, frequent visiting and supervision of defectives, and the prevention of their marriage. I think the question of sterilisation may be disregarded. Some authorities advise as the only solution the provision of special colonies with cottage homes and workshops for cases from the age of 4 upwards.

PLAGUE PREVENTION AND THE FUMIGATION OF SHIPS.

THE United States Quarantine Regulations require that ships entering their ports shall be fumigated every six months, but [1] it became known last year that many ships in which there were no rats were being compulsorily disinfected in compliance with regulation. Fumigation being not only an expense to the shipowner but a restraint to trade, the Public Health Service determined to inquire whether in some or all ships the six months period might be safely extended, provided that inspection of the ship could be shown to furnish a trustworthy estimate of freedom from rats. A very complete Inspection Report was drawn up in which the evidence of rat presence in the ship, hold by hold, space by space, was to be stated as—none, old, fresh (slight, 1–5 rats; moderate, 5–10; marked, over 10). The signs of rat infestation depended upon were: rat droppings, rat runs, gnawed woodwork, damage to cargo, rat nests, and rats, alive or dead. After this Report had been filled up for 100 ships in which on subsequent fumigation in New York Harbour the number of rats found dead corresponded very accurately with the forecasts, it was clear that the method had approved itself, and a larger test of 200 vessels was made. Of these, 91 (uninfested) were excused fumigation, while in the other 109, it was estimated 1786 rats existed. Actually 1813 rats were found dead in them after fumigation, a discrepancy of less than 2 per cent. Accordingly ships found free from rats by the New York inspectors are no longer compulsorily fumigated. This is a great advance, for it now becomes the shipowner's interest to eliminate rats from his ships, whether by trapping, rat-proofing, or whatnot, and the risk of spread of rat-carried plague over the world is diminished.

PROTECTIVE COLOURING IN WAR.

THE news of the impending change in the standard uniform of the French army from horizon blue to khaki will excite the interest of the soldier, the scientist, and the sentimentalist. No nation has emphasised the trappings of war more than the French; they have even coined a special and untranslatable word for it, *panache*. And perhaps no nation has suffered more severely from this appeal to military ardour through the eye; at Waterloo, for instance, Napoleon was led into fatal delay while he passed his army in review, and in the early days of the Great War thousands of French soldiers were unnecessarily sacrificed to the German machine guns by their uniforms of scarlet and blue.

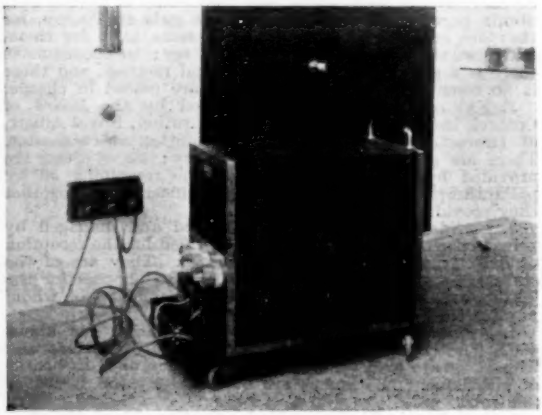
The disadvantage of being conspicuous is sufficiently obvious, but invisibility also has its dangers, and a minor military problem of to-day is to devise new methods of letting the guns know the position of the infantry during an advance, thus preventing occurrences such as the shelling of the crest of Sari Bair after our own men had won it from the Turks.

If invisibility is to be the criterion for the colour of a field service uniform, the soldier may well ask what is the scientific evidence which has led to the adoption of khaki by the great majority of the nations. Protective mimicry in the animal world merely demonstrates that to be seen with difficulty an object must resemble its background; few natural backgrounds are uniform in colour, so most animals which strive after invisibility are of mixed or variegated shades. In this connexion Gérard and Devismes recently tested the visibility of targets of different colours against various backgrounds under various conditions of light.[1] The colours chosen were scarlet, green, royal blue, white, mouse grey, and dead-leaf brown. As might have been expected, mouse grey and dead-leaf brown (defined as the colour of a withered beech leaf) were by far the least conspicuous. Between these two there was no practical difference. If we grant, however, that grey or brown is less generally visible than blue, the question arises as to which shade of grey or brown is the best and on this point, so far as we know, there is no scientific evidence.

The original khaki was introduced for service in India by the Guides about 1848, and was a light dust colour with a hint of orange (Urdu: *khak*, dust). With its adoption as a field service dress for the whole army a shade of green crept in, and during the late war almost every variation could be seen. The United States and Irish Free State armies emphasise the greenish tint, while the French Colonial army has introduced a rather dark brown element. What is required is some research into the production of a tint which will have the greatest possible invisibility under the greatest number of conditions. Perhaps the uniform of the future will resemble the young plover in colour, having a pepper-and-salt ground with dark blotches. Meanwhile, anyone who has seen a Franco-British attack and remembers, as he must, the long dim khaki lines change suddenly to the challenging horizon blue, will congratulate the French Army on a very wise change.

ELECTRIC HEATING INSTALLATION IN AN OPERATING THEATRE.

A SUCCESSFUL method of utilising electricity for special heating purposes in exceptionally difficult circumstances has been applied in respect to the operating theatre of the Harwich and District Cottage Hospital. This hospital is equipped with a central heating system, and in order that the operating theatre should be kept at a suitable temperature, it was found necessary to keep the main boiler going practically all the year round and at times when it was not required for the general heating of the hospital. The problem which faced the managerial staff was to raise the temperature of the operating theatre during periods when the main system was shut down and extra heat was necessary, the process to occupy about 30 minutes. The problem was accentuated by the fact that whatever system was employed, owing to the lack of space, the apparatus after performing its duties would have to be of a type easily and quickly removable. The solution was the adoption of the portable electric radiator shown in the illustration, which has been a success. The apparatus is of the "Magnet" type manufactured by the General Electric Co., Ltd., is loaded to 12 k.w., and the desired temperature is raised well within the time required. A tray is provided for the flexible tubing so that it may be quickly disposed of when the radiator is wheeled out of the theatre.



[1] Surgeon C. V. Akin and Acting Assistant Surgeon G. C. Sherrard, U.S. Public Health Service, in Public Health Reports, April, 1927.

[1] Boigey, M.: Presse Médicale, April 30th, p. 555.

PRINCESS MARY AT HOSPITALS.—Last week Princess Mary had two hospital engagements. On Tuesday she opened, at the Kent County Medical Hospital at Barwing, near Maidstone, a new nurses' home, which has cost £50,000, and has accommodation for 140 nurses; and on Wednesday she opened the Queen Alexandra wing of the King Edward Memorial Hospital at Ealing.